NATURE MAGAZINE

JUNE 1925

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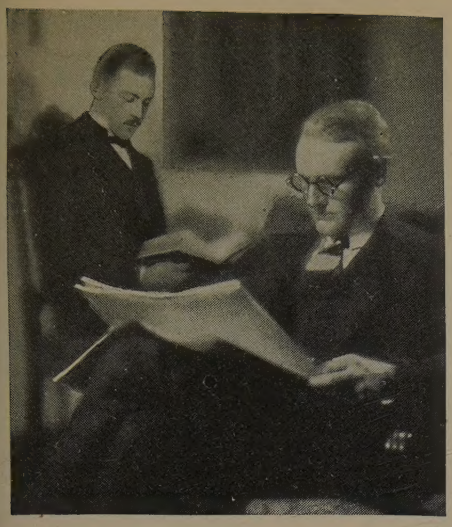

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A Valuable Volume

Out of the wealth of experience amassed during twenty years of study and service as a university professor and twelve years as director of Nature Study in the schools of Los Angeles, Dr. Charles Lincoln Edwards has acquired a vantage point from which he is equipped to contribute largely to the field of Nature Study. He has done so most admirably in his volume, *Nature Study, Part I*, the first of a series of three volumes which makes the reader and student hope that the next two parts will be soon forthcoming.

"Nature study is the true basis for all knowledge," says the author in an introductory chapter that sets forth the spirit of Nature Study in forcible manner. "Through this dominant interest the child is led to know of the living things about him. Not merely are the facts of Nature important, but much more valuable is the fascinating story of how and why these facts came to be."

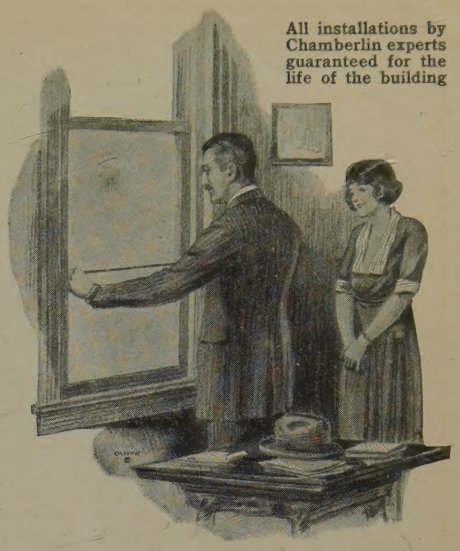
Dr. Edwards advocates the accumulation of a small nature museum by the students, gathering the material out of common experience and gaining thereby an intimate knowledge of the subjects. He interestingly lays particular emphasis on the value of sense education as applied to Nature Study. This method of approach is one that is frequently overlooked or not properly understood. There is particular clarity in the author's exposition of this phase of the volume.

Having established these bases of his subject, Dr. Edwards proceeds to the soil as a fundamental to other life, logically taking up next plants, flowers and trees. Mammals follow, and birds, reptiles, amphibia, fish, seaside life, snails, slugs, earthworms and insects in the order named.

The author's treatment of his subject throughout is entertaining in presentation. It is replete with specific suggestions for practical work. Having established in this volume a fundamental material, Dr. Edwards should find opportunity in the succeeding volumes to add even more valuably to a valuable volume.

For the Lay Astronomer

Those who would know the skies will welcome the translation of Fabre's "The Heavens," done by Dr. E. E. Fournier d'Albe and published by J. B. Lippincott Company of Philadelphia. In this volume the great naturalist treats his subject with the lucidity and charm that he has imparted to his works on Nature. The introductory chapter on the geometry of the skies is pleasingly simple, and this



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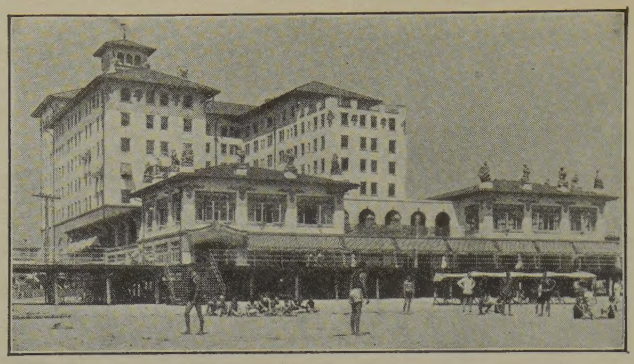

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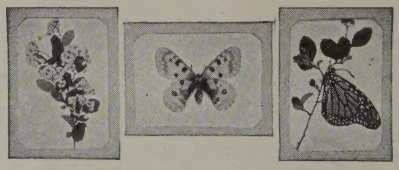

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simplicity of treatment continues throughout the book. Despite this, or, perhaps, because of it, the volume does not deal too greatly in generalities but really imparts the scientific story of astronomy in technical terms that even the layman can follow and understand. Each chapter is called a "lesson," and to study these lessons is to enjoy them.

Nature Study Books

"Nature Study is but a part of the great fascinating out-of-doors brought into the schoolroom." This is, in effect, the dedication of the Nature study textbooks written by J. Bradford Craig and published by the McIndoo Publishing Company of Kansas City, Missouri. The key volume is a teacher's manual, amply suggestive of subject matter and methods of approaching the various phases of the material. The accompanying volumes are four in number, covering the grades from the third to the sixth. All of the volumes are amply illustrated and the text of the grade books is well designed to fit into the gradual progress of the student in other school studies. These volumes constitute a valuable contribution to Nature study literature.

Nature and Health

Nature plays a fundamental part in the working out of a valuable quartet of books on health for the youngster, written in two instances by J. Mace Andress, of Boston University, and in two other instances by Mr. Andress together with Dr. W. A. Evans, whose newspaper health articles are nationally known. The books are published by Ginn and Company. These four volumes reflect the new tendency in juvenile health books and textbooks in that they approach the question of health from the inspirational point of view rather than from the standpoint of trying to scare the child into good health habits. They are entertainingly written and illustrated, without the gruesomeness that marked some of the earlier school health textbooks, and they are really intimately related to Nature study.

On Meteors

In his volume, "Meteors," published by Williams & Wilkins Company of Baltimore, Charles P. Olivier, Associate Professor of Astronomy at the University of Virginia, has filled a lack in recent astronomical literature. His volume is the most comprehensive on meteoric astronomy within the past fifty years, and as such is a contribution of distinct value. His first chapter is devoted to historical conceptions of meteors and the progress of acquaintance with them. He progresses then to consideration of the observation of meteors, the comets, the leonides and carries the student into the field of his

volume from these. It is an admirable astronomy textbook, although in the main the layman would find it somewhat mathematical. Its intention, however, is textbook service.

Tree Identification

"The subject of tree and wood identification may be introduced into our public school curriculum at any time after the fourth grade," says James Berthold Berry, M.S., in his book "Southern Woodland Trees," published by World Book Company, 2126 Prairie Avenue, Chicago. "Surely every high school graduate should be able to recognize all the important trees which occur locally and to speak intelligently of the character and uses of the wood. In connection with the study of birds and other phases of nature study, the identification of trees should be made a part of every field trip. Pupils should be encouraged to bring leaves and twigs from home in the identification of all trees on the home grounds. A portion of the school planting may well consist of a small tree garden for use in connection with this subject."

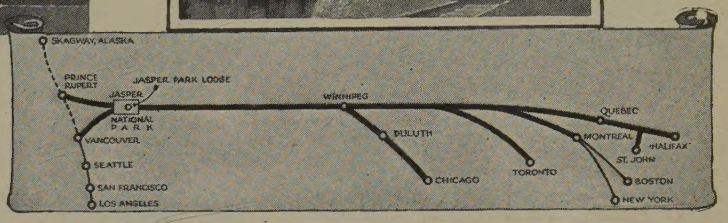
What Nitrate Is

"The nitrate of commerce is a white sugar-like substance from which the highest grade gunpowder is made; it is also used in chemical works to produce nitric and sulphuric acid, etc., but the bulk of it is employed as a fertilizer, doubling or tripling the harvest." So says Annie S. Peck, A.M., F.R.G.S., in "South America," published by George H. Doran Company, New York. "A mineral substance, it is distinguished from guano, the excrement of birds. As its origin, there are various theories, but none is generally accepted. A by-product, a yellow liquor, which in its preparation is drawn off from the nitrate into a crucible, is then chemically treated, and poured into a retort. On cooling it leaves on the dish a blue crystal, the iodine of commerce, which costs as much per ounce as saltpetre per 100 pounds. The casks in which it is placed are covered with green hides which shrink and keep out the moisture. Worth $300 to $400 a case, the iodine is shipped in the treasure vaults with bullion. Formerly 40 per cent of the nitrate went to Germany, 30 to the United States, 20 to France, the rest to Great Britain and Belgium."

The Bobolink

"The bobolink should be given a place among our half dozen best songsters. He has a wonderful range of notes and it would be hard to improve on his song," says Floyd Bralliar in his book, "Knowing Birds Through Stories," published by Funk & Wagnalls Co. "Beautifully colored as he is, his mate is a dull, sober-looking brown bird. Nevertheless he is always proud of

See Mount Robson Monarch of the Canadian Rockies on the Triangle Tour



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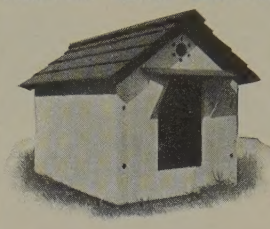

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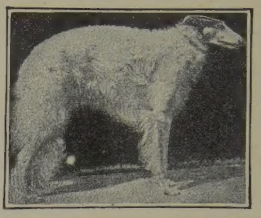

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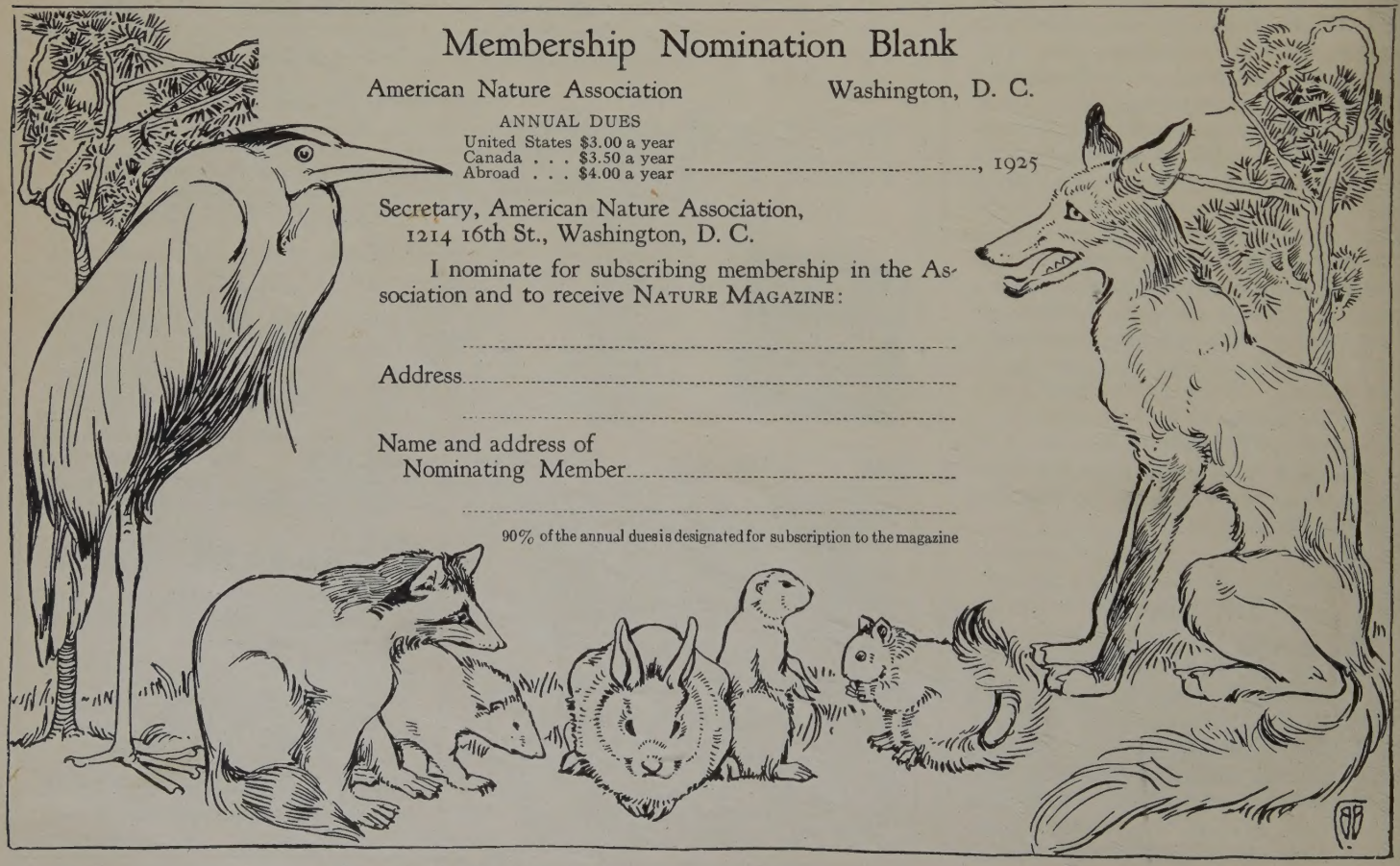

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her and does his utmost to entertain her with song during the brooding season. He feeds on a variety of things, eating caterpillars and insects of various kinds greedily in the summer time. He seems to be especially fond of army worms, those caterpillars that form in numberless bands and march through our fields destroying everything. When the babes arrive, however, he prefers to feed them on young grasshoppers. Those who have watched him feed his young, patiently noting hour after hour and day after day what he feeds, claim he has a great preference for green grasshoppers—not any particular kind of green grasshoppers, but just green ones—not feeding brown ones once out a dozen times."

Canoe and Camera

The call of the outdoors, the forest stream, river rapids and the wilder places is admirably answered in an attractive booklet, "Canoe Trips and Nature Photography," published by the Canadian National Railways. "How we all crave the chance to do deeds that whip up the physical sinews that most of the year lie dormant! How we reach out, when opportunity offers, to play our part in any exploit by field and river and to reenact even for a little time and in our own small way the stirring annals of our pioneer fathers!" declares the introduction to the booklet. A number of canoe routes are mapped out with a view to their wealth of photographic opportunity for the vacationer who would rather shoot with a camera than a gun. Further information, with maps and directions are offered by the General Tourist Agent of the railways at Montreal. The Canadian National, by several of its recent publications, is adding valuably to Nature and out-of-door literature.

About Wild Flowers

The Extension Service of the Ohio State University has done a real service through the publication of a pamphlet entitled "About Wild Flowers," written by Alfred C. Hottes. In twenty pages it has packed a great deal. The bulletin defines wild flowers as differentiated from weeds, points the way to their appreciation, cites the inroads made by misguided nature lovers who gather them thoughtlessly and urges the preservation of the flowers of the wild. The pamphlet contains a list of flowers that should not be gathered and lists of those that should be gathered with discretion, if at all, and those that are not now in danger of extermination. The bulletin is attractive in preparation and illustration.

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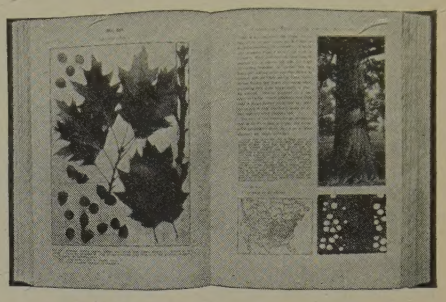

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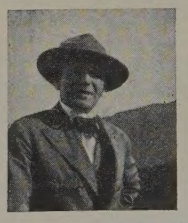

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June

Nature Calendar

JUNE

"I knew that you were coming, June, I knew that you were coming,
For ev'ry warbler in the wood a song of joy was humming.
I know that you are here, June, I know that you are here—
The fairy month, the merry month, the laughter of the year!"

—*Douglas Malloch.*

Lilac bushes are fragrant with clusters of white or lavender flowers.

Not only is the cardinal a delight to the eye but his value is also measured by the quantities of flies, beetles, grasshoppers, and other injurious insects and their larvae which he consumes daily. He is especially fond of rose bugs.

On some wooded hillside you may find the white flowers of pyrola, borne on a tall stalk. Here, too, might be growing waxy, nodding pipsissewas.

The long flowering season of field mustard has begun.

White blossoms are sheltered beneath the broad-spreading leaves of the May apple.

Sweet-scented lilies-of-the-valley are blooming in the garden.

Golden-hearted daisies whiten fields and meadows.

Where the daisies bloom, there you will find buttercups, too.

Ferns are fruiting. Beneath the fronds of most species you will find the fruiting organs—little green or brown dots.

Summer breezes are scattering winged maple seeds.

Young raccoons are about one-third grown now. They like to sun themselves outside their homes on bright days.

Peonies now display their massive blooms of white, pink, or red.

As evening falls the little brown-bat mother goes out in search of food with her young clinging to her.

In the shade of great trees, where grow dainty mosses and delicate ferns, you will find the white wax-like flowers of the Indian pipe.

The flashy plumage of the Baltimore oriole is suggestive of the tropics.

Where the light of day, subdued by the leaves and branches of forest trees falls in irregular pattern on a floor of pine needles and dried leaves, there you will find the wood frog in perfect harmony with his setting.

Solomon's seal trails a fringe of delicate flowers in the tangled thicket.

The chestnut tree now is hung with long flowering catkins.

Snowball and spiraea shrubs are white with blossoms.

You may find the delicate-scented magenta-crimson orchid, Arethusa, in some unfrequented bog, lone survivor of ruthless flower collectors.

The yellow-breasted chat is building a nest in the bushy undergrowth.

Barn swallows are living in remodeled nests on the beams of the barn.

The goldfinch now is feathered in his summer costume of bright yellow and black.

Listen for the lackadaisical song of the wood pewee. Sometimes he seems too lazy to finish his drawling "Pe-a-wee."

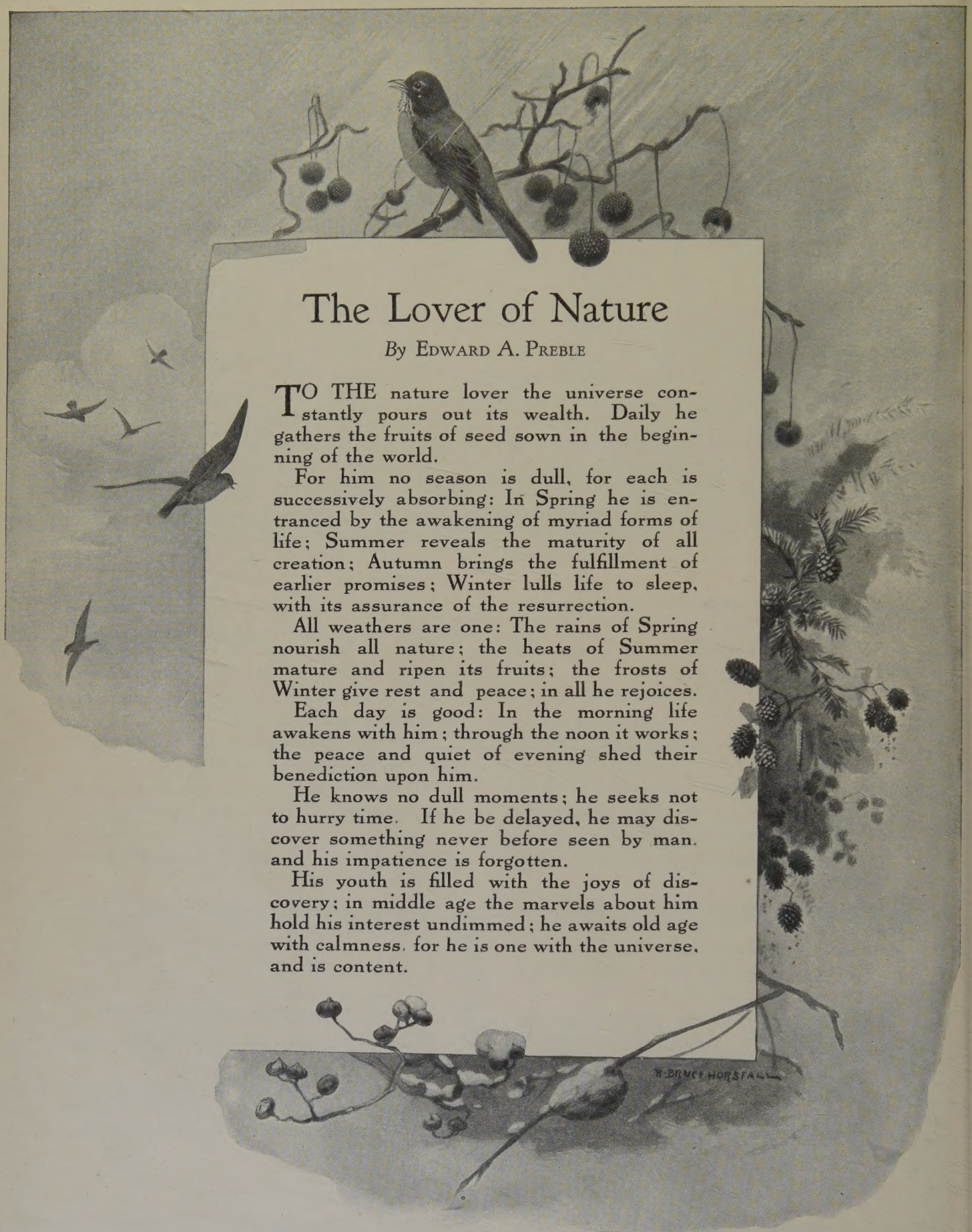
"In June the fields and meadows echo with the bobolink's 'mad' music as on quivering wing he sings in ecstasy to his mate on her nest in the grasses below."

At this time golden plovers are breeding along the shores of the Arctic Ocean.

Dragon flies soar above still waters where mosquitoes abound in great numbers.

A common sound of the ponds is the deep bass voice of the bull frog. Here you will find him hiding among pickerel weed, arrowhead, and water lilies.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History



The Lover of Nature

By EDWARD A. PREBLE

TO THE nature lover the universe constantly pours out its wealth. Daily he gathers the fruits of seed sown in the beginning of the world.

For him no season is dull, for each is successively absorbing: In Spring he is entranced by the awakening of myriad forms of life; Summer reveals the maturity of all creation; Autumn brings the fulfillment of earlier promises; Winter lulls life to sleep, with its assurance of the resurrection.

All weathers are one: The rains of Spring nourish all nature; the heats of Summer mature and ripen its fruits; the frosts of Winter give rest and peace; in all he rejoices.

Each day is good: In the morning life awakens with him; through the noon it works; the peace and quiet of evening shed their benediction upon him.

He knows no dull moments; he seeks not to hurry time. If he be delayed, he may discover something never before seen by man, and his impatience is forgotten.

His youth is filled with the joys of discovery; in middle age the marvels about him hold his interest undimmed; he awaits old age with calmness, for he is one with the universe, and is content.

Nature Magazine

Vol. V JUNE, 1925 No. 6

"Each gaze at the glories of earth, sky and ocean,
To my kindled emotions was wind over flame."
—BRYANT.

The Surf Scoter

By BEN HUR LAMPMAN

(ILLUSTRATED BY A FULL-PAGE INSERT IN COLOR FROM A PAINTING BY R. BRUCE HORSFALL)

ON A WINTER day when the voice of the surf is a crashing tumult near at hand, and a dull, reiterant thunder far inland, you may have seen the scoters. Out from the battered headland, where the combers came racing in, wild and white, they flew low and heavily in the trough of the waves, and settled to rest in waters where no boat dare make its way—rising and falling on the troubled breast of the sea, now lost in spume and spindrift, now dark against the emerald flank of a wave. They are well-called surf ducks.

Few of the true sea ducks have that trace of poetry in contour which is the heritage of their inland cousins. For if the pintail is a bird of consummate modeling, whose lines are as flawless as the perfect vase, the mark of gentle rivers and still lakes is on him; whereas the sea has stamped the others for her own, roughly, bluntly, serviceably. And among sea ducks none looks the part in greater degree than the scoter, sturdy as a merchantman, built for the very life he leads, with grace sacrificed to solidity, and bright plumage to brave endurance. No surf shall ever run too high for him.

Of the three species of scoters that regularly inhabit both coasts of this continent, two are more commonly observed on either shore—the surf scoter and the white-winged. The latter is readily distinguished by the prominent white speculum of the wing, whence the bird derives its name; while the former, in the case of the male, is known from afar by the white patch at the nape of the neck and the triangular white spot on its forehead. Both are otherwise black of plumage, but the male surf scoter has a livery to match the crow, and sports as well a particolored bill, singularly gibbous or humped at the base, so that what little brow the fine fellow should have is quite obscured by this adornment. It lends to him an air one trusts is most misleading, since it would indicate that intellectually he hails from beyond the stockyards.

The scoter, of whatever variety, is not esteemed as a table duck, owing to the nature of its own diet, and though sportsmen shoot it down in a desultory way, they do so for lack of better game and in regret that nothing else is awing at the time. Thus an ignobility of flavor has preserved to us, in something like the numbers of yesterday, a sea duck essentially interesting and typical of its ocean habitat. Yet one suspects that hunters have nevertheless a tolerant if secret affection for the scoters, since it was they, no doubt, who gave to these waterfowl such a confusing variety of names. The fact testifies to an interest in the scoters and their ways, such as has been bestowed on few ducks. The surf scoter, for example, boasts more titles than a penniless nobleman, having upwards of a score of local names, among the more elegant being those of plaster-bill, morocco-jaw, goggle-nose and snuff-taker. The more common name is coot. Indomitable creature, he has survived them all.

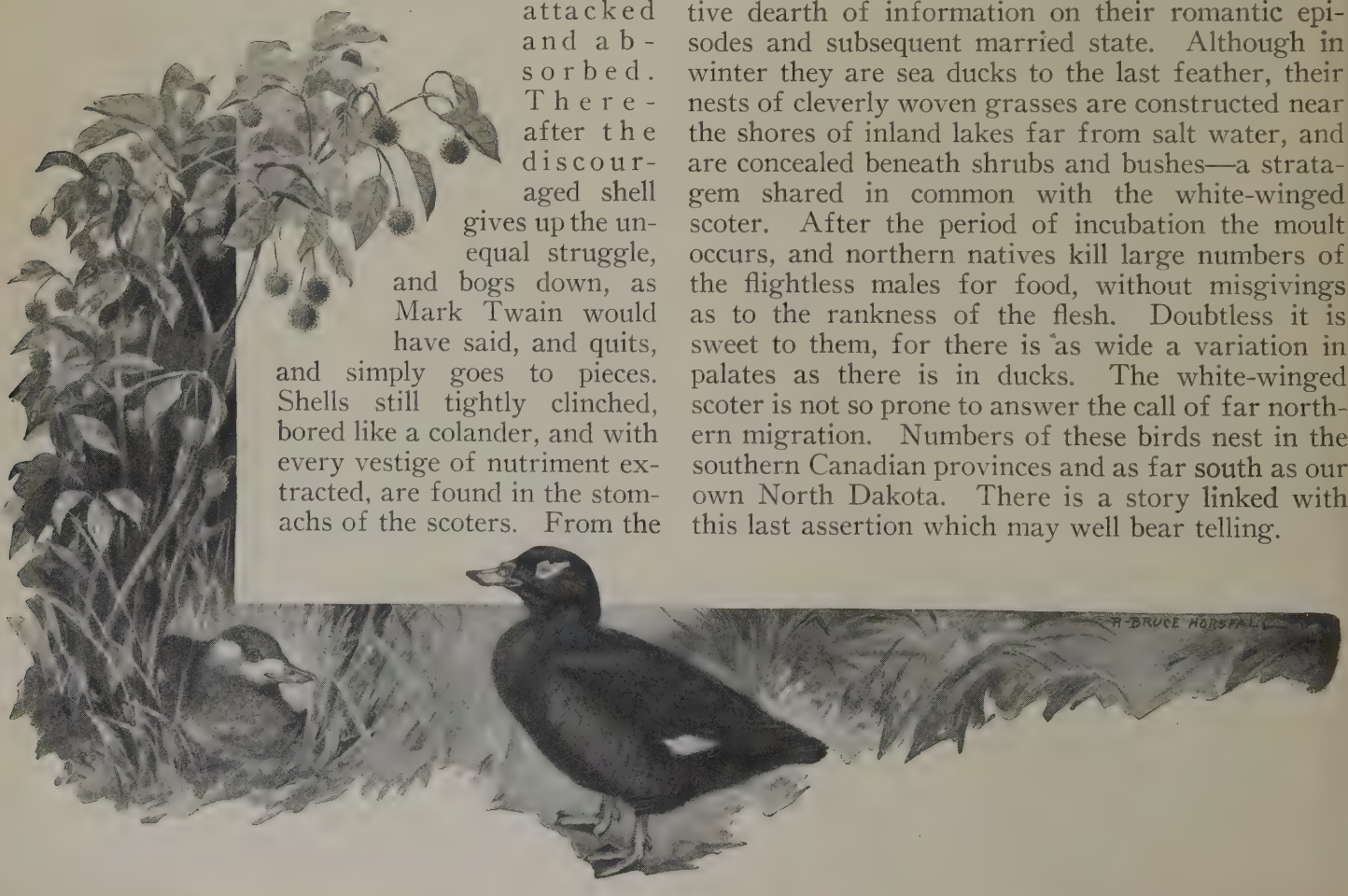
As befits a surf duck, the scoter finds his dinner at the bottom of the sea; and this, you well may venture, is why no epicure ever has sung the praises of the family. The bulging jaw muscles, the heavy mandibles, bear witness to his fondness for shell fish, and despite the bulk and seeming clumsiness

of his body the scoter is a famous diver—for a duck. He cannot vie with the grebes or the loons, of course, those wizards of the craft, but he can sound in twelve feet of roaring green water and snatch from the sand or ooze the mollusk suiting his fancy. On some such business as this the surf scoter is bent, those times you catch the shimmer of his black coat in the broken, treacherous tide he frequents—of his glossy coat and the white triangles at nape and crown. Crown? A bit too far forward, perhaps. The books say forehead—but forehead he hasn't.

The digestive processes of the scoters are so thorough and courageous that even a longshoreman must envy those gifted ducks. Since the powerful mandibles are incapable of crushing the mollusks on which the scoter feeds, it follows that every shellfish goes down not only on the half-shell but the whole. Think for a moment, if you please, of being restricted to a diet of oysters or of butter clams, swallowed in their stony jackets—and then reflect upon the dreary interval that must ensue before one's astounded stomach has solved the problem. The scoter has no reluctance and not a single regret. The powerful gizzard, furnished with teeth of gravel which attacks this hard fare is so violently potent that holes are speedily eaten through the shell, until the hapless mollusk is riddled and its flesh attacked and absorbed. Thereafter the discouraged shell gives up the unequal struggle, and bogs down, as Mark Twain would have said, and quits, and simply goes to pieces. Shells still tightly clinched, bored like a colander, and with every vestige of nutriment extracted, are found in the stomachs of the scoters. From the stomach of one taken on the Oregon coast more than a teacup of shell fragments was removed. Up to the moment of its demise, when it fell to the gun of a naturalist, the scoter was in the best of health and spirits. And that is the sort of digestion that harvest hands must doff their hats to, most respectfully, as one who meets a master.

It has been said of the scoters, and in particular the surf scoter and the white-winged, that they are a nuisance to oyster growers, levying heavy tribute on the beds of young oysters. This charge was brought a few years ago in the Pacific northwest, with reference to oyster losses on Puget Sound, and though it is surmised that any sensible scoter would not disdain an oyster, chance-met—as were those bivalvular friends of the Walrus and the Carpenter—the truth seems to be that the surf scoters were unjustly accused, in the main. They were law-abiding birds, bluff and honest fellows, quite content with their own breakers—while the real culprits were the white-winged scoter and the blue-bill scaup duck. It was only another of those lamentable instances in which a bad name is given without due reflection or inquiry. The surf scoters are still trying to live it down.

The surf scoters spend their summers far to the north, and rear their broods in the shadow of the bergs, so to speak, which accounts for a comparative dearth of information on their romantic episodes and subsequent married state. Although in winter they are sea ducks to the last feather, their nests of cleverly woven grasses are constructed near the shores of inland lakes far from salt water, and are concealed beneath shrubs and bushes—a stratagem shared in common with the white-winged scoter. After the period of incubation the moult occurs, and northern natives kill large numbers of the flightless males for food, without misgivings as to the rankness of the flesh. Doubtless it is sweet to them, for there is as wide a variation in palates as there is in ducks. The white-winged scoter is not so prone to answer the call of far northern migration. Numbers of these birds nest in the southern Canadian provinces and as far south as our own North Dakota. There is a story linked with this last assertion which may well bear telling.



"GREAT RAFTS OF WATERFOWL, SHINING IN SUNSET"

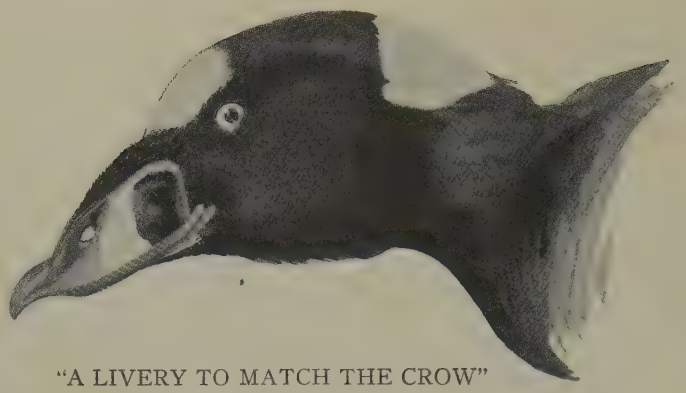
Many years ago, Alf Eastgate, farmer-naturalist, living on the shores of Stump Lake, North Dakota, discovered and duly reported the nests of white-winged scoters that had chosen the strange alkaline lake as their breeding water. Several pairs of these ducks were nesting on the bird islands midway of the lake, where often eastern ornithologists came to study the many waterfowl that bred there.

Into the Dakota country there poured, by a hundred air lanes, the clamorous snow geese, the sonorous Canada honkers, and the advance guard of the ducks, bright in their bridal plumage. It was late March and the snow was worn thin on the fields, with here and there the black loam bared, or an acre of yellowed grass land. All the snow-shoe rabbits were in motley. In brief, it was spring, and winter-wearied folks laughed and looked skyward, calling. "Hear them!" Honk! a-honk! honk! Musical as trumpets.

And with the feathered voyageurs came the scoters, alighting heavily near the bird islands, clamorous with flocks. They set about the building of their nests as the season advanced, and the moody females were dreaming of ducklings when an eminent ornithologist arrived from the east to visit Eastgate and the islands. You may be sure that Alf chuckled as he bent to the oars, the very day his guest came, for neither would sleep without the proof of the fact that the scoters were there. Gulls rose in scolding flocks as they landed, cormorants sheered heavily away from their rude nests of twigs, and Eastgate and his friend stepped gingerly to avoid treading on eggs and fledglings. Beneath the low shrubs of the island they found the white-winged scoters nesting, and since that day the official record includes North Dakota in the breeding range of the surf ducks.

There is another story, an amusing trifle, of these same islands in the North Dakota lake where Alf Eastgate found his scoters. The tale is duly set down in that august, if somewhat diverting, journal—the *Congressional Record*. In the House of Representatives a member from the middle west was urging the approval of appropriation for the Stump Lake islands as Federal bird refuges. He was eloquent, as one must be who had known those waters and loved them, marsh breeze, brown rushes, great rafts of waterfowl shining in sunset, whistle of many wings, and the babel of the joyous flocks.

Why, said he, there nested on those islands such interesting and magnificent creatures, such a variety of rare and valuable feathered folk, as to challenge the admiration of any naturalist, any lover of Nature and her ways. It was but fitting that this heritage of wild life should be transmitted, undiminished, to the generations. No. Do not smile at him. He was both gentle and sincere. He had heard the geese swing in from the south when winter waned, seeking their lake; he had watched the last flock linger as the ice pressed outward from the shore with the return of winter; linger, and rise at length, regretfully. And because this love for waterfowl strikes a responsive chord in every normal heart, he held the House that moment, eagerly listening. This approximate conversation ensued:



"A LIVERY TO MATCH THE CROW"

"I would like to ask the gentleman a question," said a southern member, rising. "Are there any mammals on those islands?"

"As to that," replied the champion of waterfowl, still in the daze of his own eloquent plea, "I cannot say. But I will say, if there are any, they should be given adequate protection with the rest of the birds."

The bird islands refuge received their license to persist. The white-winged scoters continued to breed there. Along the eastern seaboard, sportsmen who have watched the gradual diminution of the flocks, the virtual disappearance of this or that variety, are given to saying that some day the duck hunter may be well content with a bag of despised scoters. Let us hope the day is far removed, and that, indeed, none of the generations of the future ever shall see its dawn. We have need for more refuges, for greater sympathy, for conservation that shall and must lessen the destruction of bird life, and preserve for our descendants a goodly number of each race.

Some day in fall, when the surf thunders, and you are filled to happiness with the salt tang of the sea, you may catch through the drifting spume a glimpse of the scoters, dark against the smooth flank of a wave. It is their canvas. They are one with the picture.

Saving the Wood Bison

THE WOOD BISON is a well-marked form differing from the bison of the plains in larger size and darker coloration. It now survives only in an area between lower Peace River and Great Slave Lake in central Canada. Here a preserve, known as the Wood Buffalo Park, has been established by the Canadian Government as one of the steps taken to perpetuate the race.

For various causes this once-abundant form, originally occupying a much larger area, became reduced to only a few hundred animals. Beginning about fifteen years ago protective measures were instituted, resulting in a notable increase. The latest estimate indicates the existence of about 1,500 animals. These herds, comprising the only uncontaminated wild bison in the world living in a state of nature on their original ground, now occupy an area eminently suited to their needs in the center of the range where the race was evolved.

Conservationists have recently been aroused by a proposal to introduce animals of another race into this unique assemblage. The herd of American bison, descended from Montana stock and now kept in the preserve at Wainwright, Alberta, has outgrown the natural resources of the enclosure. It has been proposed that a part of the annual increase of these be shipped to the Wood Buffalo Park, there to interbreed with the present residents.

The introduction of the remnants of a race less well fitted to stand the rigors of semi-arctic conditions must inevitably result in the deterioration of the Wood bison, one of the most notable races of large ruminant known to the world. It is hoped that the Wood bison will be kept a pure race.

Avalanche Lily and Her Cubs

By F. W. SCHMOE
Naturalist, Rainier National Park

APRIL was ushered in this spring by a balmy Chinook wind that blew for days across the forest-clothed shoulders of Rainier. Above timberline wintry weather still prevailed but down on the lower slopes brown and green patches began to appear in the woods and to spread rapidly like the brown feathers on the moulting Ptarmigan of the ridges above. In shady canyons the snow still lay deep on the ground.

On the third day after the break "Avalanche Lily" put in her appearance at the power plant on the Nisqually and friendly relations were reestablished with the electrician and his family. "Avalanche Lily" is a bear, a blond black bear of unquestionable character, cheerful disposition and unsatisfiable appetite. She was almost famished—apparently. Her four months' fast just over was sufficient reason, of course, but this spring there were other reasons—two of them.

On the day following her first appearance, having assured herself of her reception, she came back, this time poking before her nose two ragged little cubs. They were ungainly rascals about the size of house cats, with short fur, and heads and ears entirely too large for their bodies. One was a blond like his mother but the other was a decided brunette as a black bear should be.

The mother, though careless herself, was taking no chances with her cubs. On reaching a tall fir tree a hundred feet or so from the house she informed the twins that they were to climb to the first branches and remain there until called for in person. This, after being repeated a few times, and emphasized by more pushing in the direction of the tree, was understood and acted upon.

THE TWO HAD GREAT FUN TOGETHER

A man could not have stood the rolling and cuffing the cub seemed to like.

BROWNIE WAS DESERTED

His mother departed and left him to spend the summer alone along the Nisqually.

She presented herself then and demanded food. A couple of hours later, having been convinced that no more rations were to be distributed that day, she returned to the tree, from which the cubs had not stirred, and called upon them to come down. The ensuing conversation cannot be translated literally but without doubt it was about as follows:

"Come down, now, time to go home"—no response from the balls of fur seventy feet above. Perhaps they did not hear.

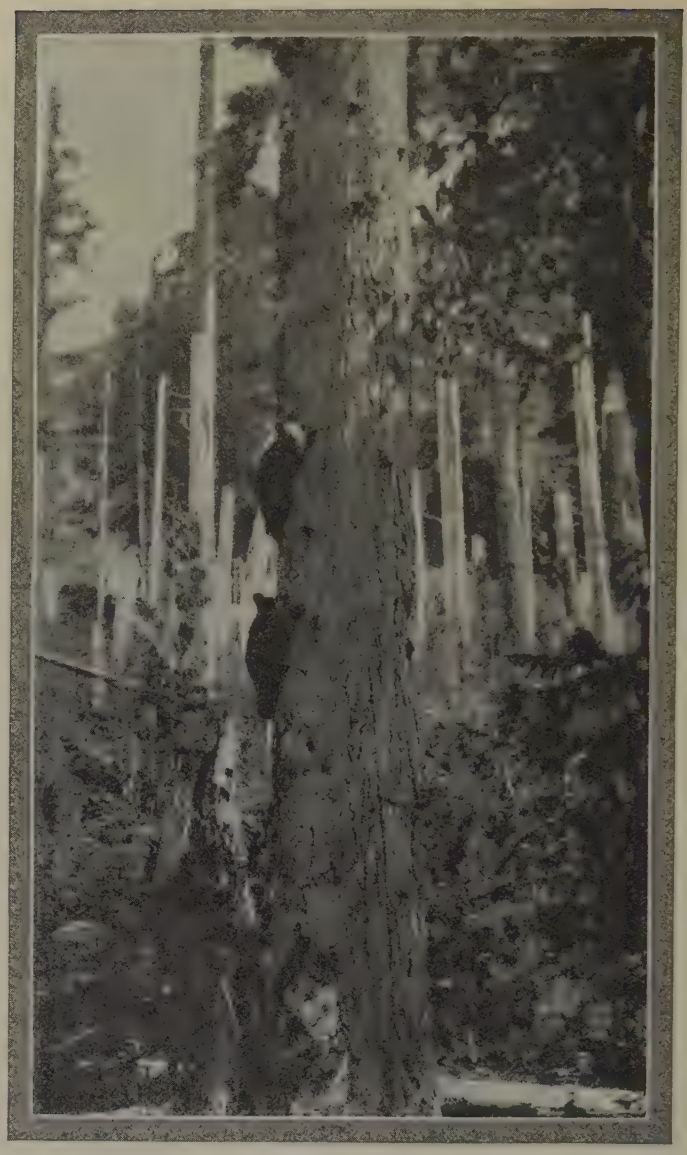
"Come down, I say," This time louder. Grunts and whines from above which meant, "We don't want to, we're afraid we will fall."

"If you two don't come down right away I'll come up and get

you." Which she proceeded to do.

Then followed a week or so of the same program. Between noon and mid-afternoon each day mother and cubs would emerge from the brush at the foot of a rock slide, take a look around, then amble leisurely to the big fir tree. The cubs would be sent aloft to remain until the mother was again convinced that no more food was available, or until dusk began to fall. The conversation at the tree always followed and the mother was always required to climb up and bring the cubs down.

From the first the two were very active and though apparently clumsy on the ground, they had no difficulty at all in climbing trees. Evidently, however, they preferred this particular tree three feet in diameter with the first branches seventy feet above the ground. These branches were flattened and densely matted and provided at the same time a safe sleeping place and a vantage point from which the mother could at all times be seen. Strangely they never enjoyed the process of coming down; perhaps they were less sure of their little claws on the descent than the ascent, or, since a bear backs down a tree like a cat, it may have been that not being able to see their road they were cautious.



SHE WOULD SEND THE TWINS TO SAFETY

The mother bear always insisted that they climb a tree while she sought food.

ARGUING ABOUT THE BATH HOUR

Mrs. Bruin takes her cub in for a washing and the youngster is apparently protesting having its ears washed.

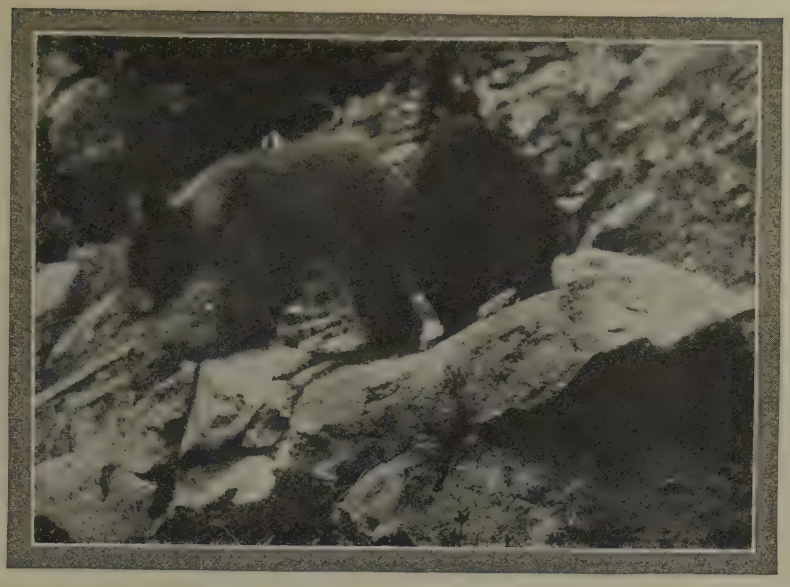
It was two weeks before the mother could be induced to bring her progeny down to the plant and even then she watched over them very carefully. Although she had no fear at all of the people with whom she became acquainted and would eat from their hands she would allow no one to approach the cubs. On their part they preferred to remain undisturbed in the background.

As time went on the cubs began to round out and were more playful and less shy until finally the little family became very much at home around the power plant and paid no more attention to strangers who kept at a safe distance than they did to the whir of the turbines inside.

On these daily visits the mother bear spent most of her time eating or begging for more to eat, while the youngsters amused themselves by climbing over logs or boulders or in friendly scuffles over some bit of food. These were not bottle babies and every little while the mother was tormented into allowing them to nurse.

Before long it became noticeable at the plant that the addition of

three such hungry folks made a decided increase in the grocery bill, even with the donation of liberal supplies of table scraps from the hotel down the river. By now the weather was very mild and most of the snow had gone, so the daily ration was cut considerably and it was hinted that Avalanche Lily and her children might at least attempt to supply their own wants. This suggestion was acted upon the following night but not in the way intended. The family agreed to serve themselves but still from the electrician's pantry. In the middle of the night everyone was startled from bed by the crash of a window, and Mrs. Bruin was found to be in the pantry helping herself promiscuously. On her next appearance there was no misunderstanding the fact that she was no longer a welcome guest, and the very next day the brown cub sauntered down the trail all alone. Even the misused electrician could not refuse the little scoundrel his dinner.



THE TWINS AT FOUR MONTHS

After a time they became more playful and more at home.

The next report of Avalanche Lily was from the road camp at Narada Falls four miles above. With her was the little black cub who was later to become famous about the park. As soon as the road was cleared to Paradise Valley about July 1 the auto campers began to arrive and along with them came the brown mother bear and her small black son. During the remainder of the summer they were often seen in the valley. Food was gladly accepted in exchange for picture rights but no further concessions were ever made. A pony guide who undertook to pet the little fellow later swore that he had lost all interest in bears, and a tourist who tried to corner the pair in order to get pictures at very close range reported to the office that bears were a menace to the safety of travelers in the park. But those who watched the pair gathering blueberries on the ridges above the glacier or frolicking together of an evening down by the little reflection lakes will always remember the sight as one of the finest of their lives.

When any trouble was brewing the cub was always ready with encouragement for his mother but not with assistance. He found it more to his liking to take to the nearest tree and to direct proceedings from there. The chattering he could do on such occasions was worthy of an outraged squirrel. Curiosity was a great force in his life as with most animals, and he was forever prying into boxes or carrying away camp equip-

BLACKIE UP HIS TREE

When trouble was brewing the cub gave its mother moral support from the nearest tree.

ment. One day he picked up a knapsack laid down by a tired hiker and scampered away with it. When the owner gave chase the mother thinking her cub was in danger joined in with the result that the knapsack was for the time being entirely forgotten. On another occasion he was found trying to make away with a camera that even he knew did not belong to him.

SOME TIME WAS SPENT BATHING

The favorite playground was a little open meadow and two or three small ponds.

The favorite playground of the bears was a little open meadow just below the camp where there was lots of fine grass and two or three small ponds. There was no doubt that the two had great times together. Some time was usually spent bathing and chasing frogs in the ponds. Considerable rough play always followed in which the poor little cub suffered a lot of rolling and cuffing on the part of his mother. Although a man would have been more or less damaged by such treatment the cub seemed to enjoy it immensely.

With the closing of the hotel in September the two went farther back into the wilderness to live and were rarely seen. On October 10 a ranger returning from the Ohanapecosh found them in a blueberry patch near Reflection Lake. By then the cub was the size of a fairly large dog though much heavier. Without doubt they were doing well as there was a heavy crop of berries that year in the valleys. Ten days later the first big snow came. With the coming of the heavy snow in the high country the bears and deer descend to the river bottoms where later the bears den up for the winter.

No one has been able to say why the brown cub was left behind at the power plant. He was apparently either entirely forgotten or else left intentionally as the mother spent the entire season within five miles of the plant and she knew the trails well.

During the summer Brownie divided his time between the power house and a mining claim across the river with occasional visits to a nearby auto camp on the road where he never failed to find admirers who were willing to feed him. At the claim he played with the children of the miner and slept in a nearby tree. There were a few chickens about the place but the cub never seemed even to notice them.

Early in August the rangers at Longmire decided to capture him and take him to the lower hotel where the cook would care for him and he would be a great attraction to the tourists. According to the rangers this transfer could be easily arranged, so a truck was commandeered and the bear located without delay. A pint of syrup was produced and with young bruin eating eagerly from the can it seemed an easy matter to lay hold of him. It was, but then things began to happen and happen in such quick succession that the ranger was very glad to let loose at the first opportunity.

A few days later the Park Naturalist hearing that the cub had resisted arrest decided to try his hand at the capture but with improved methods. He also thought it wise to keep his plan to himself so that if he failed no one need know it. It would have been an easy matter to rope Brownie, but for fear of hurting him he tried a box trap. A large packing box was placed on its edge and the bear coaxed alongside with pieces of bacon. Then the box was quickly turned over him. Immediately the happy naturalist fell upon the cage—only to find that it was not there and that the cub was well on his way up the nearest tree. He was a perfect little whirlwind, that bear, with amazing strength for his size in spite of his butter-ball appearance.

After two such experiences we were afraid that the cub would lose faith in human nature and retreat to the wilderness, but he did not. Not long after he was again at the power plant absorbing his can of condensed milk per day and happy as ever though shy at any near approach. On September 16 no brown bear appeared and no one has seen him since. The electrician is afraid he was kidnaped, but the ranger from Longmire and the Park Naturalist are sure in their own minds that he was not. More likely he merely decided it was time to break home ties and to learn to shift for himself, for it was nearing the time for him to select his first winter den.

The May Flies' Dance of Death

By WILLIAM ATHERTON DU PUY

THIS is the season of the year when one may see that strange, joyous tragedy, the dance of death of the May flies, those dainty fairies of Nature which, at the approach of summer, come into the world for a day, frolic themselves to death in the sunshine, and are gone.

Read here their story; then go forth and, with understanding, witness one of those rare idyls of the open.

One moment an ugly creature of the mud, the next, as though by the gesture of a magic wand, the May fly is off, radiant as an oriole, with a shimmer of new-found wings, fragile as the gossamer of a spider's web, with its streaming two or three thread-like tail filaments, twice as long as its body, marking time to its fitful, up-and-down, joyous flight.

Out there in the blue, as by instinct, it finds its mate, for this is its bridal day. The two frolic together for an hour in a world that seems too gross for creatures as fine as they. Then they part, and each, ceaselessly, goes on and on until the last bit of vitality in its frail body is spent.

Then one settles, perhaps on your coat sleeve or mine. The feet with which it clings are unused little feet, for all its life it has been in the air. They are hardly able to support even its dainty weight. It wavers there for a moment and tumbles over like a bit of thistledown. Its brief span of life has come to an end. The May fly is dead.

So brief is its life that one who would make its acquaintance must hurry. The opportunity comes but once a year—in the early summer—and is not unlikely to impress itself on the individual who lives near a lake or a river, for the May fly is water-born, and near borders of it is likely to be very plentiful. For one day or two or three in the year the lake dweller is likely to have the existence of the May fly impressed upon him. The street light in his town may draw millions of them from the darkness roundabout—millions that happen at that moment to be engaged in the fling that comes in that short time when they are given wings. The street lights may be darkened with them, the pavements made slippery with their crushed bodies. The street lights of Atlantic City gather, each season, a countless toll of May flies. So do those of Niagara, and Natchez on the Mississippi, and Geneva on its far-away Swiss lake, and ancient Bagdad where the Tigris flows down to the sea. Along the St. Lawrence and on the shores of the Great Lakes, May flies swarm by the million so as to produce imitation snowstorms in the summer. The air is thick with them. They become a nuisance, but a nuisance so short-lived as not to be a great hardship.

EPHEMERA, THE MAY FLY

Its name suggests its fleeting life, enduring but a day.

A strange creature is this dainty May fly. One of the strangest things about it, again quite fairy-like, is the fact that it eats nothing from its cradle to the moment of its death. Thrust into a world where nearly every living thing is constantly in search of food, the May fly goes its way with never a thought of food. Surrounded by creatures that lie in wait and devour each other, the May fly eats not nor thinks of eating. It does not even possess a mouth with which it might eat if it felt so disposed. It comes into the world with a certain amount of vitality in its frail body, it

dances gaily until that strength is gone, and dies.

Equally strange is the birth of the May fly, a birth which almost any observer may witness if he happens to be sharp-eyed by the waterside almost anywhere at just the right minute. If he watches closely, he may see many tiny creatures as big as house flies emerging from the mud at the bottom of the lake or stream. These little creatures are in the act of doing a very unaccustomed thing. They are leaving their usual place of abode, where they have stayed close at home for two or three years, and coming to the surface—a thing they have never done before. Perhaps they merely float to the surface of the water, or perhaps they crawl up on some stone or twig at the water's edge.

These are ugly little water insects with sturdy legs, an active tail used in swimming, and with gills through which they breathe as do other water creatures. But as they reach the surface of the water, a most surprising thing happens. Their skin down the back splits open, there is a wriggling within it and, quickly as a flash, there emerges, not this water creature in a new dress, but a dainty May fly, a thing as different in appearance from the water insect from which it came as a peacock is different from a rat. In a way it is more different, for but a moment ago this creature breathed water through gills like a fish, and now it breathes air and would drown if you thrust it under the water.

This new-born creature stretches its gossamer wings and flutters away to a nearby twig. There, in a very few minutes, it again sheds its skin, even to the covering on its wings. It is strange in this also, the scientists say, for it is the only creature under the sun which sheds its skin after it has acquired wings. Then it flies away on its endless dance until the time of death.

Back of this brief blaze of glory in which the life of the May fly goes out there is, however, a long period of preparation. The little water insect that gave birth to the May fly has been battling for its existence for one or two or possibly three years among the creatures that live in the mud at the bottom of the water. The original egg from which this insect came was laid by a May fly two or three seasons ago. It sank into the mud and there hatched into the larva, a crawling and wriggling creature, which kept growing and developing into higher forms.

These insects have difficulties peculiar to them as they grow. Their skins or shells will not stretch, so they grow inside those skins until they become too tight. Then they burst open, and a new and looser skin forms, which is worn until it again becomes too light, when it likewise is burst and discarded. As skins are discarded there are often quite pronounced changes in the nature of the insect. The larva, for instance, later takes the form of what is known as the nymph, and this nymph emerges into the full grown insect. These three forms are common to many insects.

It is on this day of frolic that the May fly lays its eggs. Through all the three years of its cycle this is the only day upon which this creature takes thought of its own reproduction. It is undoubtedly true that Nature transforms the mud-inhabiting grub and turns it into a creature of the air for this brief period that it may be given an opportunity to scatter its eggs far and wide.

While on the wing the May flies spread out over the surface of the water. Those of them that strike inland, that congregate about street lamps, fail of their purpose, have lived to no avail. As their more successful fellows float so waveringly up and down in the sun over the water they are directed by instinct to plant their eggs where they will have a chance to hatch out into other generations of May flies. Some of them drop their eggs and flit about a while longer until their strength is gone, and in doing so sink to drop to watery graves. Others fold their wings about them and plunge into the water, diving deep to assure their deaths. It is the way they want to die—in the performance of their purpose. Their final mission is accomplished, their day of glory at an end, their dance of death completed. What could be more fitting than that they rest in the water that so long sheltered them and is to shelter their children and children's children.

Answers to May Nature Puzzle

The answers to the puzzles given on page 318, May issue, are: Pondweed 4; alfalfa 1; corn 3; Virginia creeper 2; young radish 6; old radish 5; cattail 9; water-lily 10; pumpkin 7; Russian thistle 8; violets and hepaticas would be least likely to suffer and adder's tongue if picked above leaves would probably suffer little; mandrake, trillium and columbine would probably suffer most; mullein would be left because of its low growth and unpleasant mat of hairs, and thistles would be left because of their prickly nature; jewel-weed 24; teasel 22; orchid 25; hawkweed 21; sleepy catchfly 23; meadow rue 27; scarlet sage 28; knotweed 26; the butterfly would profitably visit the evening primrose; the bee, the trillium and marsh marigold.

Air and Its Dusty Freight

By CHARLES FITZHUGH TALMAN
U. S. Weather Bureau

AIR IS not one thing, but many. This important fact is often overlooked or ignored, even in scientific circles.

When you study chemistry you learn that certain substances are "elements." They contain no ingredients; or, rather, each contains but one—itself. Iron, carbon, sodium, oxygen, hydrogen—these are examples of elementary substances, though they are very rarely met with unmixed with other things. Chemistry also tells us of "compounds." Each of these is composed of two or more elements, always united in exactly the same proportions. A compound is, as a rule, very different in its qualities from the elements of which it is compounded. Thus the gases hydrogen and oxygen unite to form the compound that we know as water. The poisonous gas chlorine and the metal sodium form, as a compound, common salt.

There are substances of a third kind, known as "mixtures." Their ingredients—which may be elements or compounds or both—retain their original properties when they mix, and usually different samples of a mixture differ considerably in the relative amounts of their constituents.

Air is a *mixture* of gases, which are not chemically combined, and which are very different from one another in their properties. Roughly speaking, it is about four-fifths nitrogen and one-fifth oxygen, with small proportions of many other gases. Some of these gases were unknown to science before the last decade of the nineteenth century. One of them—argon—forms about 1 per cent of the atmosphere, yet it escaped detection until the year 1894. Chemists are still seeking for unknown ingredients of air, as well as for more definite information concerning those already recognized. In recent years there has been a good deal of discussion about the amount of hydrogen in the atmosphere. According to the late Lord Rayleigh it averages 0.003 per cent, by volume, but certain other authorities find a much smaller proportion. Helium, the light gas that has recently been turned to account in filling airships, forms a minute fraction of the air we breathe—about 1 part in 245,000. There are still rarer constituents. Krypton forms about 1 part in 2,000,000 and xenon 1 part in 17,000,000. Some authorities include radium emanation among the permanent gases of the atmosphere. We are told that a cubic centimeter of air contains among its thirty million million million molecules only between one and two molecules of this substance, on an average.

Water vapor—i.e., water in an invisible gaseous form—is the only atmospheric gas that plays a distinctive part in the production of weather. Besides being the source of clouds, rain, snow, dew, etc., it influences the temperature of the atmosphere in several important ways. The amount of it found in the air varies greatly from place to place and from time to time, ranging from a small trace to more than 4 per cent of the volume of air. On account of this variation, it is customary to disregard water vapor in stating the normal percentages of the different atmospheric substances. Such statements also disregard the higher levels of the atmosphere, many miles above the earth, where, with increasing height, the lighter gases become more and more prevalent and the composition of "air" (if we may still call it by that name), is entirely different from that found near the ground.

PHOTO U. S. WEATHER BUREAU

HOW DUSTY IS THE AIR?

This Owens dust-counter is the latest of the many devices used for measuring the dustiness of the atmosphere.

Dry air at ordinary atmospheric levels contains from 20.90 to 21.00 per cent of oxygen. This substance is continually being taken out of the air in great quantities by animals and plants, by the combustion of fuel, by the rusting of iron and in various other ways, yet its percentage remains remarkably constant. Though we know certain ways in which the supply is replenished, its constancy is something of a mystery. Even more remarkable is the fact that the gas carbon dioxide, although it is constantly being abstracted from and added to the air by agencies having no dependance upon one another, always constitutes very close to 0.03 per cent of the atmosphere. The above figures for oxygen and carbon dioxide refer only to the air out of doors. Indoor air may contain as little as 20.00 per cent of the former gas and as much as 0.36 per cent or more of the latter—without, let us add, usually affecting human health and comfort. A greatly exaggerated importance was once attributed to a deficiency of oxygen and an excess of carbon dioxide in the air of factories, mines and other places.

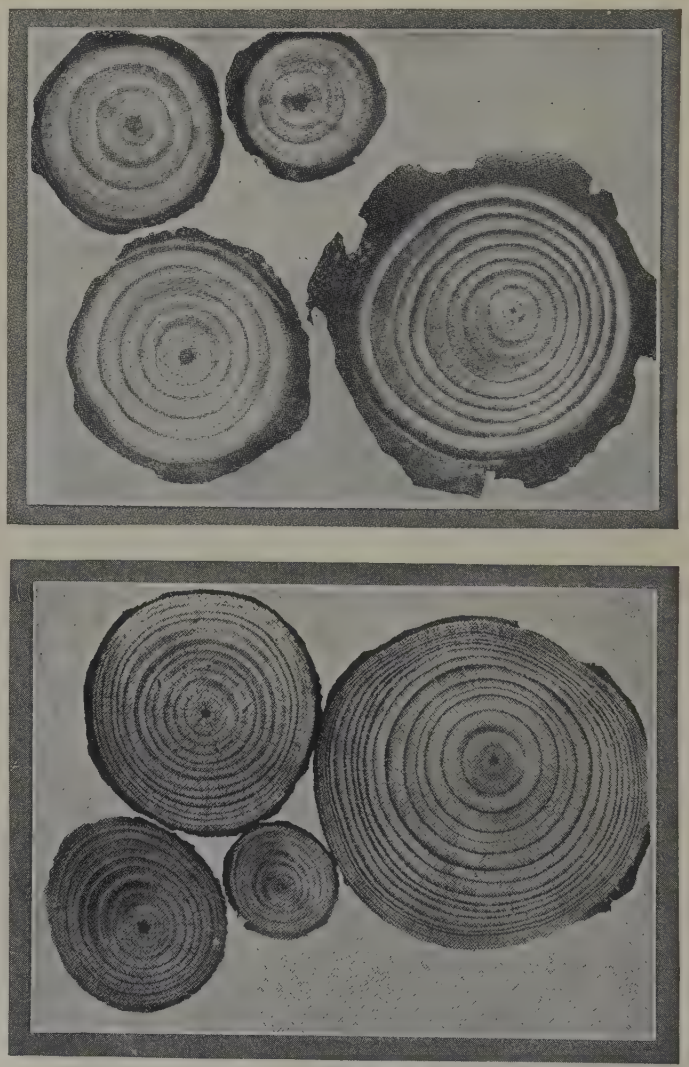
Years ago a great deal was heard about ozone in the atmosphere. This substance is a variety of oxygen, but is more active chemically than the ordinary gas and is a powerful disinfectant and deodorizer. Nowadays it has many useful applications in the arts. Its presence in the air, first reported by the German chemist Schoenbein, began to be a matter of popular interest after the middle of the nineteenth century. So-called "ozone papers" were exposed to the air at many places throughout the world. The intensity of the blue color assumed by these papers was supposed to be an indication of the amount of ozone present, but we now know that the color was affected by other atmospheric substances and that such observations were quite worthless. We know, also, that the ozone in ordinary outdoor air is so insignificant in amount that it cannot have the health-giving properties formerly ascribed to it. Recently, however, this gas has acquired a new and romantic interest on account of the discovery that it is relatively abundant in the upper levels of the atmosphere, where, through its effects on radiation, it is supposed to exercise more or less influence on our weather and climate.

Though air contains small percentages of the lightest known gases, it hardly deserves its proverbial reputation for lightness. Under average sea-level conditions a cubic foot of it weighs an ounce and a quarter. A cubical room 30 feet each way would contain a ton of air. The total weight of the earth's atmosphere is known pretty accurately, because we know the area of the earth's surface and we also know, from the readings of barometers all over the

PHOTO U. S. DEPT. OF AGRICULTURE

WHAT SMOKE DID TO AN ORCHARD

The trees have been killed by smoke from the factory in the background.



COURTESY MELLON INSTITUTE ON INDUSTRIAL RESEARCH

SMOKE AND THE GROWTH OF PINE TREES

Upper sections from trees grown in smoke-free atmosphere; lower from trees grown where smoke has prevailed in recent years. Note the stunted annual rings.

world, the average force with which the atmosphere, under the effect of gravity, presses down upon our globe. The whole burden amounts to upward of 5,000,000,000,000,000 tons. Half of this enormous weight belongs to a layer of air less than four miles deep at the bottom of the atmosphere.

Our forefathers knew only a few uses for air. Today we look upon the atmosphere as a field for exploitation quite as important as the ground beneath our feet. The modern industrial chemist mines the air on a vast scale for nitrogen and oxygen, and to some extent for its rarer gases. The "fixation" of atmospheric nitrogen in the form of ammonia and other compounds has already relieved the once critical shortage of these products. Most of the oxygen used in the industries for cutting and welding metals and other purposes is obtained by the process of liquefying air at low temperatures. Compressed air is a wonderfully efficient means of transmitting and applying power, almost vying with electricity in the number of its applications. On account of its elasticity, air is the best of shock-absorbers, and is thus used as a cushion in pneumatic tires, door-checks and elevator shafts.

One of the most important things we have to do with air is to maintain the right quality of it indoors. The art of ventilation has undergone great changes since the beginning of the present century. We have mentioned the change of ideas concerning oxygen and carbon dioxide. Another novelty is the abandonment of the old belief in "crowd-poisoning," and coupled with this is the discovery that bad smells do not necessarily or even generally indicate that air is unhealthful. The good or bad quality of air in buildings is now thought to depend almost entirely upon temperature, humidity and air-movement. A veritable library of literature has lately been produced regarding what is called "atmospheric comfort," and there are several instruments for measuring this factor of human existence. Closely allied to "comfort" is the efficiency of workmen, which is found to be strikingly dependent upon atmospheric conditions. A new branch of engineering is known as "air-conditioning." The air admitted to many factories and other buildings is washed to remove impurities and is given any desired degree of moisture, which may be either more or less than that of the air outdoors. The purpose of these "humidifying" and "dehumidifying" processes is not always to promote the health and comfort of the people in the building, but in many cases to supply the best air conditions for various kinds of manufacture in which the product is more or less affected by humidity. Air-conditioning is a regular practice in textile mills, and is common in the manufacture of candy, bread, photographic films, macaroni, explosives and many other things.

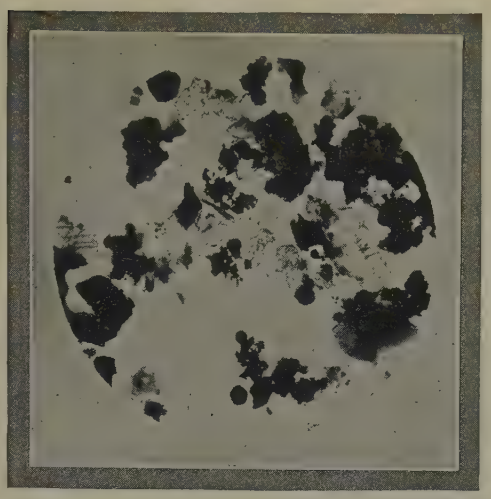


PHOTO U. S. WEATHER BUREAU

IT'S IN THE AIR

Magnified mineral dust in a sample of air taken at the top of Washington Monument.

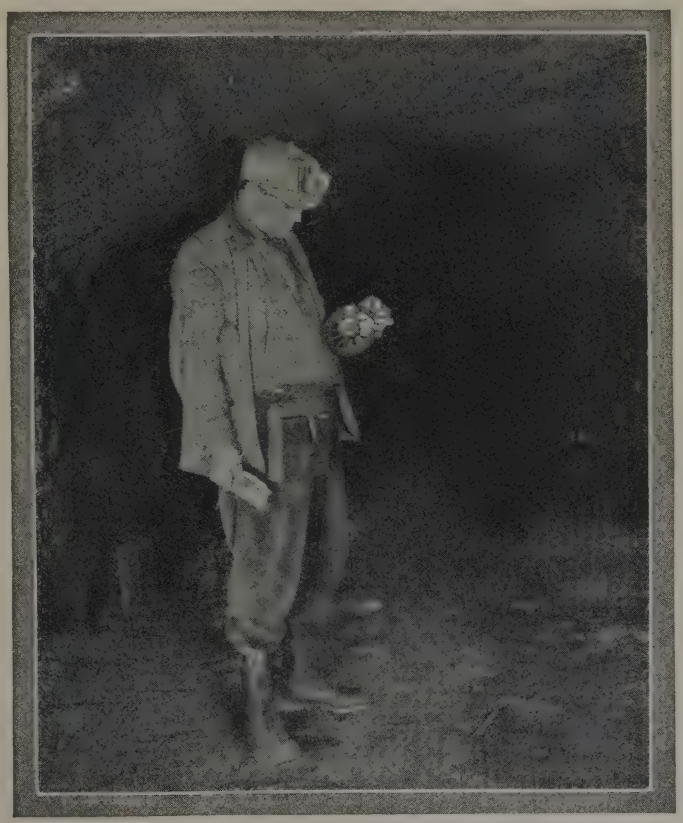


PHOTO U. S. BUREAU OF MINES

MEASURING COAL MINE AIR SUPPLY

Fire boss reading anemometer. Large mines also employ chemists to analyze the air for deficiencies and excesses.

Dust-free air does not exist anywhere in Nature, though it can be obtained by certain filtering devices in the laboratory. From the earth's surface up to regions far above the highest clouds every cubic inch of air contains dust-motes. Near the earth the dust is mostly blown up from the soil by the winds. Far aloft the millions of meteors that enter the earth's atmosphere every day contribute their quota of fine solid matter. Lastly, every great explosive volcanic eruption spouts up enormous quantities of dust to great heights.

All kinds of dust are

heavier than air. Therefore, contrary to common belief, dust never really "floats" in the atmosphere. In still air it always settles more or less rapidly toward the ground, its rate of fall depending upon its specific gravity and the size and shape of the dust particles. Other things being equal, the finest particles fall most slowly. Tiny fragments of meteors and dust particles from volcanoes take years to reach the ground from a height of ten miles or more.

PHOTO U. S. WEATHER BUREAU

DESERT DUST ON A SNOWFIELD

The dust was carried by the wind from another state. White patch near the man shows where it was brushed away.

Winds charge the atmosphere with millions of tons of dust every year and it is often carried to great distances before it settles to the earth. In China an area of some 300,000 square miles is covered to a depth of hundreds and even thousands of feet with a fine yellowish soil called "loess," which is supposed to have been brought by the winds from the deserts and dry steppes of central Asia. In March, 1901, a series of dust storms occurred in the northern Sahara and the dust, after being whirled upward by cyclonic winds to a great altitude, was eventually deposited over most of western Europe, to a distance of 2,500 miles from the place of origin. An elaborate study was made of this "dustfall" by two German meteorologists, Hellmann and Meinardus, who estimated that not less than 1,800,000 tons of the deposit fell over the continent of Europe and as much more over the Mediterranean. On the African coast the deposit is supposed to have amounted to 150,000,000 tons. A reddish haze, due to dust blown from the Sahara, is frequently encountered by vessels in the region between the Canaries and the Cape Verde Islands. This haze probably gave rise to the reports of a "Sea of Darkness" that figure in the narratives of early Atlantic navigators.

Volcanic eruptions sometimes spread a veil of dust over a great part of the globe. The remarkable "dry fog" of 1783, which prevailed for several months in both Europe and North America, was the result of volcanic eruptions in Iceland and Japan. The dust that hung in the upper air for some years after the outbreak of the East Indian volcano Krakatoa, in 1883, was responsible for gorgeous sunset glows and other optical phenomena, observed in this country and elsewhere.

Various human agencies contribute to the dust contents of the atmosphere. An immense amount of solid matter is sent into the air as the result of the imperfect combustion of fuel. The "smoke nuisance" is one of the most serious problems with which civilized humanity has to deal.

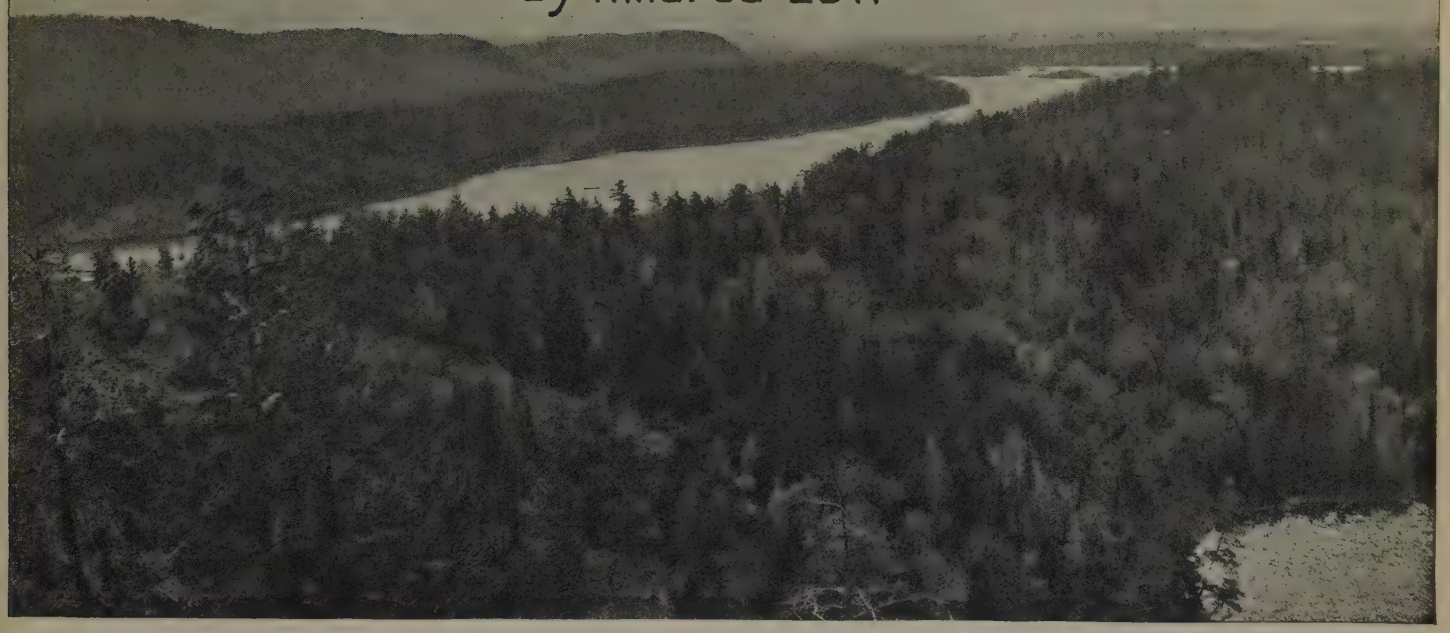
Smoke in the air, generally from the burning of forests, moors or prairies, occasionally causes darkness approaching that of night to prevail in the daytime, either locally or over wide areas. In the case of a typical "dark day" the veil of smoke is so high—often above the clouds—that the cause of the darkness is not obvious, and the uncanny effect of the occurrence is thus enhanced. When the veil is rather thin, a certain amount of sunlight struggles through, casting a yellow or coppery tinge over the landscape, as happened in New England on September 6, 1881, known as "the yellow day."

Last but not least, the air teems with life and its products, in the shape of pollen, spores, bacteria, diatoms, and miscellaneous organic refuse.

Many instruments have been devised for counting the number of dust particles in samples of air. A generation ago the standard instrument for this purpose was the Aitken dust-counter, and its indications were responsible for some rather startling statements still found in reference books; as, for example, that a cigarette smoker sends 4,000,000,000 particles into the air at every puff. What this instrument actually counted was the nuclei about which condensation occurred in the forming of an artificial fog, and it now seems probable that a large proportion of these nuclei were too minute to deserve the name of "dust," most of them being far beyond the range of the microscope, and many, perhaps, individual gas molecules. The statistics obtained with the newer instruments are, however, quite sufficiently impressive to the student of air.

The Pines of Timagami

By Mildred Low



NATURE'S GREAT SCHOOL OF FORESTRY

I saw the pines against the white north sky,
Very beautiful, and still, and bending over,
Their sharp black heads against a quiet sky,
And there was peace in them.—Rupert Brooke

THERE is always peace in the pines. They satisfy the physical senses. The eye is pleased by their rugged, irregular outlines, the delicate fringes of their evergreen, needle-like leaves, the graceful swaying of their flexible limbs. As music to the ears is the soft soughing of their branches in the breeze, and how sweet and refreshing to body and spirit is their pungent resinous odor!

There are eighty known species of the pine tree distributed in various parts of the world, nine of which occur in Canada. Three species are found only in eastern Canada, four only in the west. One variety barely crosses the international border from the northeastern states into the eastern provinces of the Dominion, while another extends right across from the Atlantic to the boundaries of British Columbia.

Whether taken up as a profession or as a hobby, no subject is more delightful, more enriching, than the science of forestry. For it is in nature's great university, the broad outdoors, that the lover and student of trees is forced by the very peculiarities of his choice to take his course of study.

The United States and the Canadian Governments have facilitated this matter by the permanent establishment of forest reserves, where camping privileges may be obtained for the asking, and the canoeing routes are endlessly fascinating. A sojourn in one of these national forests is undoubtedly the best way to learn about trees.

For the study of the eastern pine, the Timagami Forest Reserve is well adapted for Canadians. Not only is this the predominating tree of the Timagami region, but it is found here in its virgin splendor, as this area has never been invaded by the lumberman. It lies among the high hills of northern Ontario, just south of James Bay, the lower extremity of Hudson's Bay, its millions of acres literally covered with the growth of the forest primeval. Though absolutely a wilderness, parts of which have never been explored, the reserve is within easy reach of civilization via the Canadian National Railways, a line of which penetrates the southeastern corner, while various branches touch the border farther north.

Timagami station, from which the voyageur almost invariably starts out, is situated directly on the lake of the same name, and is about fourteen

hours from either Montreal or Toronto. A steamer takes the traveler from the station to one of the large organized camps on the lake, or to his own private camping ground.

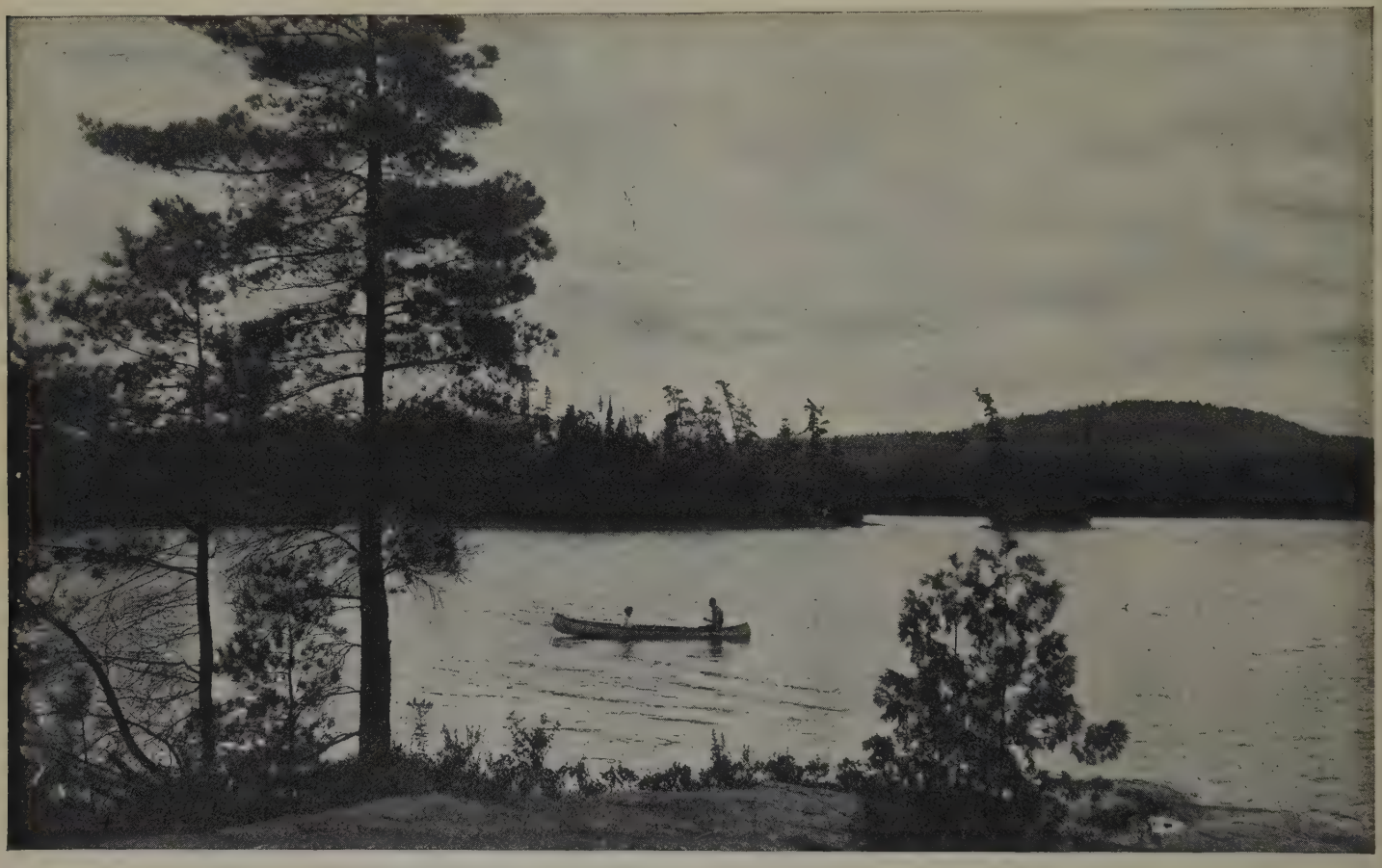
As the Timagami Forest Reserve comprises some 6000 square miles of unspoiled country, it offers infinite possibilities to the botanist, the herbalist and the forester. All traveling is done, of course, by canoe. There are routes innumerable in every direction, amidst exquisite scenery, where every turn in the course of the waterway reveals new beauties. As the fishing throughout the park is freely permitted on the payment of a trifling license fee, there is no limit to the amount of sport of this kind that the student-camper may enjoy.

In this great area, three species of pine are to be found, the white pine, the red pine, and the Banksian, or jack pine.

A description of different varieties of native trees of Canada, may be found in a book issued by the Department of the Interior, Ottawa.

"The white pine," it says, "was for many years the most important lumber tree in Canada. The wood is soft, easy to work, easy to season, and once properly conditioned holds its shape as well as any other coniferous wood known to commerce. It is used in every part of the construction of buildings from shingles to sills. A list of its other uses would include practically every wood-using industry in Canada."

This species is distinguished from other pines in the locality by the comparative smoothness of its bark and by the arrangement of its needles. The latter grow in bundles of five, unlike any other native eastern pine. On account of its thin resinous bark, the white pine is greatly subject to damage by fire. The need of extreme caution in this regard cannot be too much impressed upon campers.



THE PINE IS THE PREDOMINATING TREE IN TIMAGAMI

Three species of pine are found, the white pine, the red pine and the Banksian, or jack pine, all well distributed over this wonderful country in the picturesque woodlands of Ontario.

Of all conifers in eastern Canada, this tree is the tallest and most stately. Under favorable conditions it may reach a height of 200 feet with a six-foot diameter. Usually, however, it is not more than 100 feet high, and from two to three feet across the trunk. Its cones are from five to ten inches long, and their formation is slender, curved and stalked, with thin scales.

The red pine is so called from the intensely reddish-brown color of the bark, which is thick and resists fire fairly well. The needle-like leaves are from three to six inches long, and are borne two

in a bundle The cones are about two inches long, and more or less spherical when opened, with scales thickened at the ends. Red pine lumber is very similar to that of white pine, though darker in color and more resinous. Being also somewhat harder and stronger, it is more valuable for structural timber.

THE TIMAGAMI FOREST RESERVE

Permanent camps are established among the trees, and along the lakes in this easily accessible and alluring Canadian wilderness.

The range of the white pine and the red pine in Canada is practically the same, from the tip of Cape Breton across the eastern borders of Manitoba. Neither extends north of the height of land dividing the waters of the St. Lawrence and the Great Lakes from those of the tributaries of Hudson's Bay. This explains why, as you travel north in Timagami, you lose sight of these two fine trees; for the Timagami Forest Reserve is situated on the watershed of the two great river systems, the dividing line running between parallels forty-seven and forty-eight. North of this, the beneficent, sweet-smelling evergreen still lifts its sturdy bulk as a hiding place and protection for the creatures of the wild. The

ONE SPECIES OF BIRCH HAS A FAR NORTHERN LIMIT

The birch is occasionally found in the six thousand square miles of unspoiled country comprising the Timagami Forest Reserve, intermingling freely and charmingly with the pines and other trees.

rocky slopes of the Laurentian hills, here as elsewhere, are clothed and beautified by mantles of living verdure. It is still the friendly pine, the Canadian's well-beloved, that holds out friendly arms of cordial welcome to the voyageur.

The species common here is called the Banksian, or jack pine. It is a much smaller tree than the red or white pine. At its best it reaches a height of about sixty feet with a two-foot diameter, when growing in pure dense stands on dry, coarse, sandy lands. The jack pine also grows profusely on very poor soils or on bare rocky situations, but on such unfavorable sites it remains small and scrubby.

The leaves of the jack pine, which like those of the red pine, grow two in a bundle, are easily distinguished from the latter as they are twisted and very short, averaging about one inch in length. The cones are from one to two inches long and are usually found in pairs, one on each side of the twig, curved and pointed toward the tip of the branch. They may remain on the tree many years.

The wide distribution and common occurrence of jack pine in Canada make it a tree of considerable commercial importance, though the lumber is not nearly so valuable as that of the red or white pine. It is used for rough construction work, for railway ties, for fuel, and in the manufacture of kraft pulp.

Throughout the Timagami Forest Reserve are many other species of coniferous trees, including varieties of tamarack or larch, spruce, cedar and fir. Deciduous trees with a far northern limit are species of birch, aspen or poplar, cherry and mountain ash. These intermingle freely and charmingly with the pines, and form those dense woods that so wonderfully conserve the waters of the north, making a paradise for the sportsman and nature lover.

The Jabiru, an American Stork

THE jabiru (*Mycteria americana*) is the only member of the stork tribe found in the United States, inhabiting tropical continental America north to the lower Rio Grande in Texas. Jabiru (pronounced *jab-i-roo*), is the name given it by the Brazilians. The adult is entirely white in plumage, with naked black skin on the head and neck. Below the black neck-skin are two folds of rough reddish skin, which under the stimulus of anger, and probably also during courting, are distended to form a pouch of a brilliant scarlet color. During this process the bird assumes the peculiar attitude here shown. Since the jabiru is nearly five feet tall it presents a very remarkable appearance while thus exhibiting its charms to the interested watcher.

PHOTO KEYSTONE VIEW

THE QUEER JABIRU

Although belonging to the same family as the famous semi-domesticated bird of Europe, our stork is not very closely related to the species which there nests on the roofs of the cottages. The jabiru has, however, two rather close relatives in the Old World. These are the saddle-billed stork of tropical Africa, which has a scarlet bill with a black saddle-shaped area, and the black-necked stork of the Australian region.

As indicated by its long legs, the jabiru is a wader. Its food includes frogs, fishes, and such other creatures as it can capture about its watery haunts. When it captures a fish the bird is said to toss it repeatedly into the air, catching it in its beak at each throw until it becomes softened, when it is then swallowed head foremost.

PROTECTED BY A HARD COAT OF ARMOR

The armadillo belongs to the order of toothless animals, and with his hinged coat of bony mail, is one of the most interesting of animals.

Armadillo, the Armored Grave Digger

By WILLIAM L. AND IRENE FINLEY

Of the National Association of Audubon Societies

(PHOTOGRAPHS BY THE AUTHORS)

"CO'SE I knows 'bout grave diggas. Ain't I hunted 'em in de light ob de moon," sputtered Mose, as he shuffled into the cabin and brought out a round and emptied armor of an armadillo with the tail carefully curled to make the handle of a horny-looking basket of mosaic pattern.

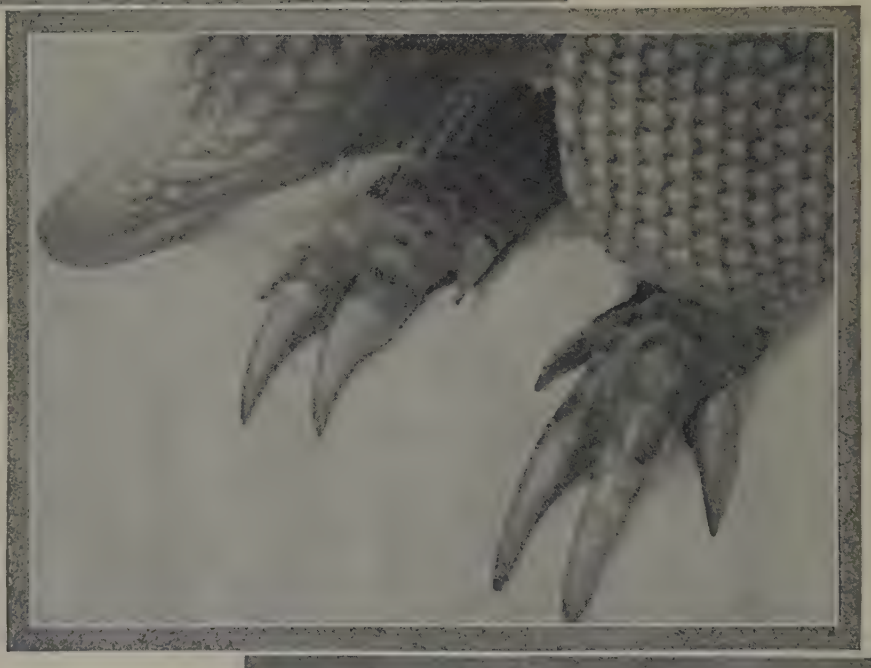
"But, Mose, we're not after the remains of a grave digger. We want to go out by the cemetery with you and see if we can catch one enjoying his supper."

Yes; old Mose had seen and caught lots of them. He knew exactly where to go. Furthermore, he had a dog that was expert in hunting armadillos. But we discovered that armadillos could only be hunted during the night because they live in holes and only come out at dark to feed.

Mose was an expert. He had hunted peccaries, or wild pigs—javelines he called them—and coons, too; but—well, Mose attributed our failure to the moon. It wasn't "ripe," he said. Try as we would, we could never find just when conditions were ripe. Our dusky friend had once found an armadillo digging in the cemetery with his front door marked by a headstone, and he was sure no animal could live

THE ARMADILLO POSES

Note his blunt nose and his strong claws.



AN ARMADILLO, HEAD ON

Front feet and nose of a young animal. The claws are equipped for digging.

and he insisted on getting back into the wagon and riding home again to await a more favorable opportunity.

In the end we were successful in the hunt, because we found a boy with a tame armadillo and he was not averse to our watching and studying the animal as much as we pleased, especially after we had paid a small price. At least, this served to satisfy our curiosity for the time being, and perhaps we learned more in playing with his pet than we would have learned out on the flat Texas plains where we might have found an animal seeking his nightly meal.

Meeting this tame armadillo was a red-letter day for Peter. His face showed an expression divided between curiosity and a touch of fear, for Peter had met skunks and porcupines, the one carrying a smell gun in his pocket, the other an abundant supply of pins under his hairy coat. Peter wagged his tail experimentally. The armadillo was scared, drew in his head and humped himself into a rounded ball. From all appearances he was just like a rock, yet he must have had some way of feel-

AN ARMORED KNIGHT OF THE ANIMAL WORLD

He can turn and bend his body because his armor is well hinged.

in such a place unless for some evil purpose.

Finally, despairing of arousing Mose to the proper pitch of enthusiasm, we suggested we might hire his dog and try it ourselves. But conditions were not quite right for the dog either. He was willing to ride out in the country but he plainly told us there was no use—the trouble was still apparently with the moon—

ing through that thick mosaic wall, for when Peter dabbed his nose against it, the tail end bumped upwards with a kick that sent Peter flying. Fortunately, however, only his canine feelings suffered, but the scare put him in a fighting mood. He snapped, but there was nothing to bite. He vented his anger in barking, but the armadillo acted as if he had gone to sleep under his protecting roof. Finally, with patience worn out, Peter then departed in a most eloquent disgust.

AN ARMADILLO UPSIDE DOWN

Rolled over on his back he closes up like a jacknife, protected by his hard overcoat.

A tame armadillo can be easily kept and raised on eggs, raw or cooked, as well as a limited amount of chopped, raw meat. This one was exceedingly fond of angleworms, and it was fun to watch him root in the soft earth or gobble up the worms we put on the ground.

The armadillo that wanders into the southern borders of our country is called "nine-banded" because the front and rear parts of the horny shell or covering are connected in the middle by rings which are hinged one to another, permitting the animal to bend or turn his body and to roll himself together in a position of more complete protection.

Mother Nature has not equipped the armadillo for fighting. He belongs to what is called the order of toothless mammals. He has no front teeth. His claws are not fitted to fight or even climb trees; they are used only for digging. Yet he has not been left without protection from his numerous enemies. From the tip of his nose to the end of his tail, he is encased in a coat of armor made up of a mosaic of horny plates joined together so that every portion, except the breast and abdomen, is protected. Whereas, in the porcupine, the hairs have become greatly enlarged and form spines which are moved by appropriate muscles and can be elevated so as to become an effective defensive armor, in the armadillo there is another queer modification of the hair. The hair has united with the hard plates developed in the skin, forming a solid armament for the upper part of the body.

While the armadillo has molar teeth it does not have the front teeth or incisors, and Cuvier placed it in the class of Edentates or toothless animals, although this is not a distinctive feature, since all armadillos have some teeth.

Formerly an ancient race of mammals called glyptodons, relatives of our armadillos, roamed the pampas of South America. They had shells of considerable thickness which were strong defensive armor, yet why did they die out? No one really knows, but the tragedy came about perhaps through some change of conditions. The largest armadillo at present in existence is the giant armadillo of South America, but it is practically extinct. The armadillo of Texas and Mexico, for all its curious armor, is helpless and unprotected from the negro and Mexican hunters who turn live armadillos into baskets to satisfy the many curiosity hunters traveling in the south. At the present rate of basket-making, the nine-banded armadillo may follow the long trail of the glyptodon to final disappearance.

Crouched by a jungle stream, the Jaguar that R. Bruce Horsfall has painted for the July issue of NATURE MAGAZINE seems ready to spring from the picture. It will illustrate an article by Dr. H. E. Anthony of the American Museum of Natural History.

Indian Pipe, a Beautiful Degenerate

By ALBERT A. HANSEN

THE PIPE-SHAPED and colorless shoots of the common Indian pipe, or ghost flower, *Monotropa uniflora,* well deserve a place in Mother Nature's curiosity shop. Uncanny but handsome, much like a plant ghost instead of a material object, the Indian pipe exerts a peculiar fascination when encountered in shadowy hollows in deep pine and oak woods, where the species thrives best.

It is a well-established scientific fact that all food, whether plant or animal, owes its origin to the ability of the green leaves to mix water from the soil and gas from the atmosphere into nourishing solids or liquids, a process called photosynthesis, because it takes place only in the presence of light. We may eat this food directly, as we do when we eat lettuce and other plants, or indirectly in the form of meat that was built up from plant food via the animal route. In the case of the Indian pipe, however, we seem to have an apparent exception, since this strange species is devoid of green, a requisite in the photosynthetic process, and occasionally thrives in such deep shade as to be almost devoid of light. The truth of the matter is that Indian pipe does not manufacture its own food as all self-respecting plants do. Instead, the fibrous roots of this chaste degenerate have fallen into the disgraceful habit of either pilfering the juices from the roots of self-supporting neighbors, or else they utilize the nourishment liberated from the decomposing vegetable matter in which they live. Evidence of their low estate is found in the colorless bracts along the stem, degenerate relics of the broad, green leaves of their self-reliant and harder-working ancestors.

WHITE, GHOSTLY STEMS

Each is surmounted by a single bell-shaped blossom.

Indian pipe may be found in the leaf mold of deep, rich woods in practically all parts of the United States except the arid regions. The unbranched, ghostly stems appear during the spring, each forming a single white or pale pink bell-shaped flower. The flower at first nods gracefully from the tip of the solitary stem, but when fruits are formed, the crooked neck straightens and the pale plant holds its head aloft among its fellows.

On account of their odd, ghostly beauty, few people can resist the temptation to carry a few specimens home as mementos of the deep woods. The pleasure is short-lived, however, since even slight handling causes the frail stems to turn brown and lose their rigid succulence.

The Indian pipe is closely related to such highly respected, independent plants as azalea, rhododendron, wintergreen, arbutus, huckleberry, blueberry and cranberry, but the plant has a degenerate and parasitic first cousin in the pinesap or false beech drops, *Monotropa hypopitys.* Pinesap resembles Indian pipe in possessing no chlorophyll, the name applied to the green coloring matter in plants, although it does have a tawny or reddish tinge. Unlike the Indian pipe, pinesap flowers are fragrant and they occur in scaly racemes. The close relationship of these two species is apparent to the most casual observer. The fragrant flowers of the parasitic pinesap attract bees and other pollinating insects. The species thrives in the shade of deep oak and pine woods, frequently in company with its paler first cousin of the woods.

The following were the animals represented in the Cross-Creature Puzzle in the May issue of Nature Magazine: Horizontal: 1 *Eland;* 2 *Ibex;* 7 *Ant;* 8 *Bee;* 9 *Tern;* 10 *Bat;* 12 *Toad;* 15 *Snail;* 17 *Cobra;* 18 *Hare. Vertical:* 3 *Kea;* 4 *Ape;* 5 *Doe;* 6 *Llama;* 11 *Gnu;* 13 *Egret;* 14 *Emu;* 16 *Sloth.*

AN INTERNATIONAL GATHERING OF PHEASANTS
Left to right, the Common English, the Himalayan Impeyan and the Japanese Soemmerring.

Pheasant, Bird of Color

By CATHERINE BEACH ELY

(PHOTOGRAPHS BY COURTESY OF THE AMERICAN MUSEUM OF NATURAL HISTORY)

IN BEAUTY and intelligence the pheasant ranks among birdland's élite. He is a bird of moods responsive to friendliness and good treatment, but reserved and suspicious when his fears are aroused. His bright dark eyes mingle gentleness, keenness and something of the tragedy of age-long persecution. When this sensitive bird lives in the open unprotected by stringent game laws, he is harassed from morning till night by hunters and beasts of prey. Hard pressed by gunmen he makes an heroic effort to live. With desperation he conceals himself as long as possible, then flutters upward in his glittering beauty, harried by dogs and men seeking to wear him out by hot pursuit.

In England and Scotland the pheasant shooting season lasts legally from October 1 to February 3. To prepare for the hunting season, pheasants are turned from the gamekeeper's breeding-yard into a preserve and bountifully fed for several months until they get so tame that they come to the call, confident in human protection. They are then shot down by hundreds. Since the preserve owner raises his own supply, this slaughter does not lead to the extinction of the birds, but it can hardly be called sportsmanship.

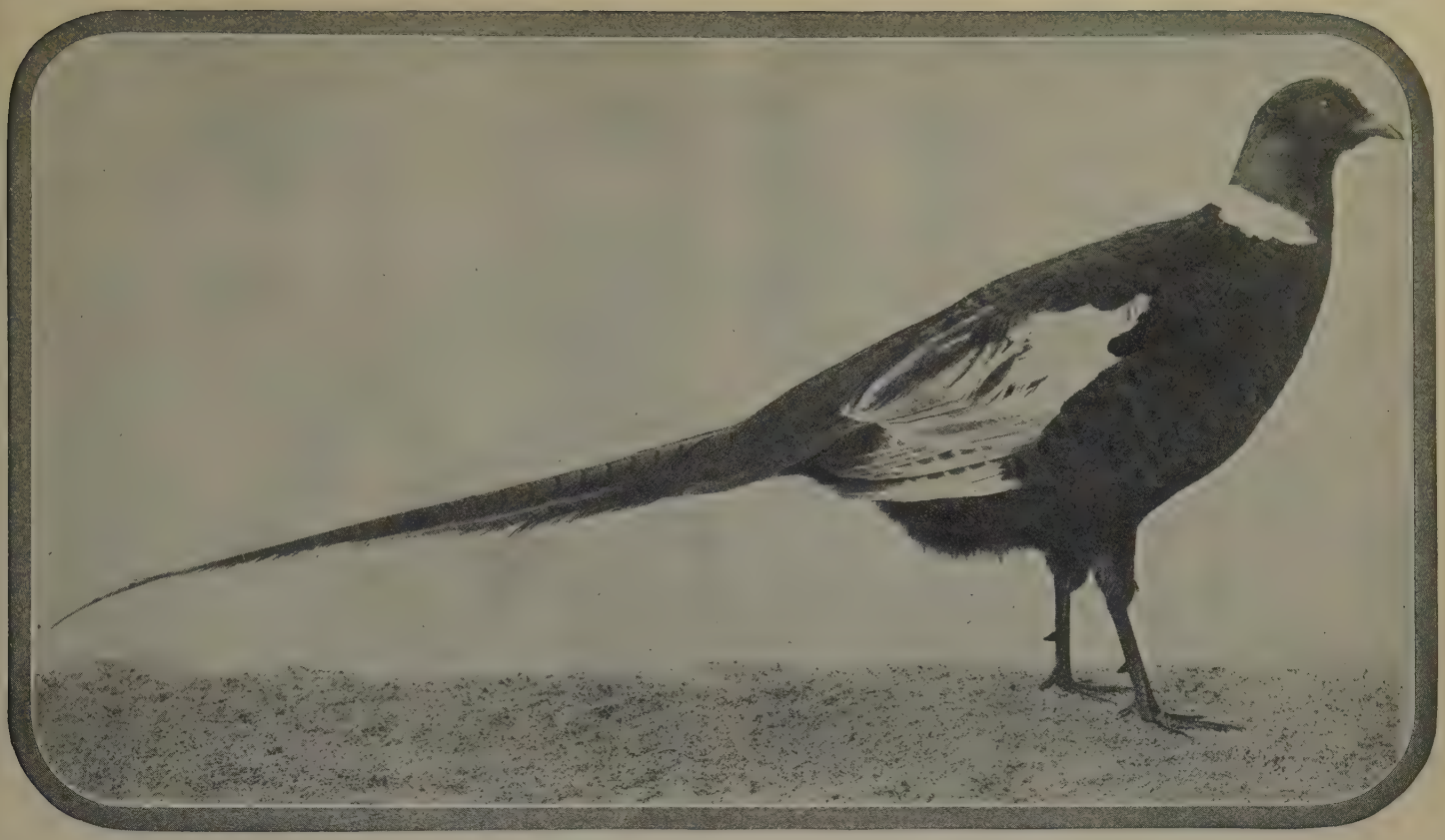
Because of the wholesale destruction of native wild life in the United States, the breeding of pheasants is becoming more and more popular. State game farms have been established in Massachusetts, Connecticut, New York, New Jersey, Louisiana, Kentucky, Oregon, California and Wisconsin, and there are numerous private breeding establishments. In England and the United States, the Ringneck, a cross between the Common Pheasant and the Ringneck pheasant, is most in demand for breeding, because it is hardy and a great destroyer of harmful insects, and because a successful formula for breeding it has been worked out.

The Reeves, Mongolian, Japanese Versicolor, the Chinese and the Ringneck are called "true pheasants," because they are adapted to the coverts of the United States, although they are frequently exhibited in aviaries owing to their beautiful plumage. The Golden, Silver, Lady Amherst, Argus, Impeyan, Peacock and Lineated Pheasants are used almost exclusively as aviary birds. Most pheasants have brilliant iridescent feathers, red facial skin and long graceful tails.

It would repay designers, decorators, and any artist in color to study in an aviary the wonderful color designs of pheasants' plumage. The rarest Asiatic species, whose plumage glitters like the jewels of the Orient, as well as the more common species, trip back and forth in their pens looking up at the visitor with the wistfulness of a gentle but untamable nature. As a breeder of pheasants expresses it, "freedom seems to be their one great desire." The great advantage of the aviary is that it protects them from constant harassment by hunters, beasts and vermin who have despoiled them.

TWO PROUD MEMBERS OF THE PHEASANT FAMILY

(Above) An Impeyan Pheasant-cock of the Himalayas, gorgeously colored, and (below) an English Pheasant whose white collar bespeaks breeding with the Chinese Ringneck.



MONGOLIAN PHEASANT-COCK

Like the Ringneck he wears a white collar on his iridescent neck and is a favorite with breeders.

THE SUNGARIAN PHEASANT

This handsome bird is related to the Mongolian and comes from the province of Sungaria, west of Mongolia.

The Impeyan Pheasant-cock of the Himalayas, one of the rarest and costliest of birds, proudly swings into view dazzling his admiring guests with his resplendent coloring. His iridescent wings are tinged with green, blue and wine color; his head and neck are jewelled with reddish orange and emerald green. He carries a beautiful crest of spraying feathers. As is usually the case among ornamental birds, the magnificent cock monopolizes the color. The female trips modestly after him in inconspicuous brown.

But the male and female Eared Pheasants from Central and Northern China are alike — the only pheasant couple in the aviary of which this is true. This species' attractive tail feathers, tipped with iridescent blue, have been sacrificed for centuries to mandarins and milliners, a decoration for the official hats of mandarins, the "numidi" of milady's chapeau.

The graceful peacock-pheasant of the Himalayas and Indo-Burma approaches the visitor rather timidly. His rich brown plumage has iridescent eyes like the peacock's.

The Golden, the Silver and the Amherst Pheasant-cocks, three sumptuous varieties, tiptoe about their cage with royal assurance, while the females keep their plain little selves in the background, content to let their spouses carry off the honors. The beauty of the Golden Pheasant of China has been celebrated by poets and artists. His daring coloring is almost impressionistic in effect. He has a scarlet breast and metallic bluegreen feathers on his back. He displays a gorgeous redgold crest, a neck-ruff of orange-red margined with dark blue, and a long black and gold tail. The Golden Pheasants are easy to breed, being hardy, but set free in the wild they are shy and apt to yield to more assertive species.

More aggressive than the Golden Pheasant is the Silver Chinese Pheasant. In design and color he is worthy of the brush of Leon Bakst. His back and tail are like a cascade of molten silver with delicate black tracings. His blueblack head and breast are offset by crimson facial skin and crimson feet. This popular aviary species thrives

FROM THE HIMALAYAS AND INDO-BURMA

This small peacock-pheasant has feathers decorated with iridescent eyes.

in captivity, but is said to have a more pugnacious disposition than other kinds of pheasants. So high strung is the Silver Pheasant that when excited he becomes vicious and may even attack a child.

The Amherst Male Pheasant struts about his pen as superbly as a French chevalier in his feudal castle. His back and breast shine with metallic blue-green light. He has a crimson crest edged with white and a white neckruff margined with green. The long graceful black and white tail is shot with a few flame-colored feathers. The Amherst and Golden pheasants interbreed freely and the progeny are more beautiful even than the parents. The Golden, Silver and Amherst Male Pheasants do not acquire their brilliant plumage until the second year.

One of the rarest varieties, the Lineated Pheasant, impresses us with his air of an aristocratic exile. He is allied to the Silver Pheasant. His dark-blue plumage is exquisitely pencilled with white and lustrous as costly silk. His color scheme is heightened by red facial skin.

When it is a question of notable and artistic specimens, Japan is not behind other nations. The beautiful pale green of the Japanese Pheasant (*Phasianus versicolor*), deepens to a rich dark green on the breast, like the shades of a jade carving. This intelligent species can be successfully crossed with the common and Chinese pheasants, producing vigorous, beautiful progeny. The aristocratic Japanese Soemmerring's Pheasant has iridescent plumage of bronze, red and gold.

The Reeves Male Pheasant is as handsome as a Persian embroidery. His golden and chestnut colored feathers are margined with black and his tail is sometimes six feet long. He is most fastidious and objects, as do all the long-tailed pheasants, to getting his exquisite feathers wet and bedraggled. The Reeves are bred on the state farms of Oregon, Connecticut and Massachusetts. They are of large size and swift in flight, but are less prolific than the Chinese and more difficult to raise.

The Ringneck Pheasant of China (*Phasianus torquatus*), known as "Chinese" in the United States, has a broad white collar. This is the variety which Judge O. N. Denny introduced into Oregon and with which the Northwest is stocked. Some experts advise game farms to specialize in the Chinese Ringneck Pheasant because it is shrewd and hardy enough to flourish over the greater part of the United States. It has been successfully used by states to stock public coverts. Like the Ringneck the Mongolian Pheasant-cock wears a white collar on his iridescent neck. Some breeders like this species very much; as it comes from Northern China it stands cold weather well. Mongolians are larger than Ringnecks and the Mongolian cross is also larger than the Ringneck and very hardy birds.

THE PATRICIAN JAPANESE COPPER PHEASANT

Its iridescent copper plumage is set off by a tail longer than most pheasants.

THE COMMON PHEASANT

The so-called English Pheasant, probably introduced by the Romans. A friendly, handsome bird.

The Common or English Pheasant (*Phasianus colchicus*), is a sociable bird with observant dark eyes, susceptible to friendly advances. The plumage of his breast is bronze and golden red margined with black. His head and neck reflect iridescent bluegreen, brown and purple shades. The back and wings are dashed with yellowish tan, coppery brown and black. He carries proudly his long tapering tail barred with black. So frequently has this species been crossed with the white collared Chinese Ringneck that it is hard to find a common pheasant without a trace of white on his neck.

The variety with which most pheasant preserves in the United States and England are stocked is the English Ringneck Pheasant called "The Ringneck" in the United States—a hybrid between the Common English Pheasant and the Chinese Ringneck. The Hybrid Ringneck male is a handsome bird. His iridescent green head has red facial skin and a splash of white on each side of the neck—remnants of the Chinese Ringneck's white collar. He bears himself like an aristocrat conscious of ancient lineage.

This Ringneck has an albino variety which ranges from pure white birds to those with white feathers on the tail and back like a snow drift, and with a white head spotted with dark feathers. The pure white albino species has been established by selection and breeds true to color. Its snowy beauty is effective in the aviary or garden.

Some naturalists consider the male Argus Pheasant to be the most wonderfully patterned bird in the world. He challenges the attention of the female by spreading his wing and tail feathers in a great fan five feet in diameter—one of the most spectacular sights in birdland. His wings are decorated with marvellous bronze-colored designs like balls revolving in sockets.

Large commercial breeders are experimenting in breeding Versicolor, Reeves, Mongolian, Prince of Wales, Golden, Silver and Amherst Pheasants, in some cases crossing them with the Ringnecks to prevent deterioration of Ringneck Pheasants through inbreeding.

Fortunately very few pheasants are sold in the United States markets for food, because the demand for breeding purposes is greater than the supply. Pheasant diseases are caused by feeding them too much or too wet food, by crowding them, by keeping them in one spot until the ground becomes infected, by dirty water in soiled utensils, by lack of green food, sharp surfaced grit and charcoal, by wet weather, and by exposure to diseased fowl.

The establishment of pheasant breeding farms and game refuges by states and private owners will help to replace the vanishing wild life of America.

PROVISO TOWNSHIP
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Our Roadside Roses

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

THE ROSES of our gardens are certainly beloved, and wild roses of European lands, as Sweetbrier or Scotch, need no singing of their praises, while the many species from the Far East, from Tea to the recent Hugonis, are the central features of any garden of roses. In numbers, our North American wild roses rank after those of Europe and Asia, yet we have some thirty species. Though these are not, with one minor exception, a part of our double garden roses, and are rarely cultivated save in botanic collections, they are still so abundant as wild plants that to few people does the suggestion come to cultivate them. Of course, there are no double wild roses, but a rose need not be double to be beloved. Were the American sorts given the centuries of care that have been the lot of the Provence, Damask and Tea, our fancy cannot depict what might evolve.

Our wild roses are common, easily grown and beautiful. They should be given the admiration and advantages afforded the Eurasian species. To love them and to grow them we must know them apart, for few are sold by dealers, and the identity is not often carefully preserved. Knowing them as wild plants you may bring them into the realm of your garden as seed or suckers.

There is no need to describe the rose bush as different from other shrubs. The leaves are of three or more leaflets, usually with prickles on the back, and with prickles or bristles on the bark. Rubus, the raspberry-blackberry group, is like that, yet the base of the leaf petiole of the rose has a pair of wide, flattened, toothed false leaves attached for some distance up the petiole, while with Rubus these stipules are narrow erect and not attached to the petiole. But the Rubus flowers grow to fleshy cone-shaped "berries," while the rose hip is like to no other fruit. There are beginners who confuse our Flowering Raspberry with wild roses because of similar flower effect in time of bloom, and some of the roses of the Rockies quite resemble the Rubus species of that region.

Geographically, our roses are of three areas. The five of our eastern states are alike in a general way, two are common through the central section, and the Rockies have a large group entirely their own.

Our eastern wild roses are very similar, but one is set apart by Nature for special virtues. Except at the base of the stoutest canes there are no prickles, bristles, or other spiny growth, and the smooth purple-red stems of the Meadow Rose (*R. blanda*) are one of the bright spots of winter bushes. In late May and all of June it bears great clusters of wild rose blossoms, as heavy a burden of flowers as any rose can boast. It should be grown wherever bushes are planted, but few dealers sell it, and many Nature lovers never separate it mentally from our other wild roses. It is almost an orphan among roses, for its nearest relatives are the Cinnamon and Pyrenees Roses of Europe, and these are thorny. Its home is eastern Canada, New England, New York, and westward around the lakes to Illinois. Unlike most wild roses it prefers an alkaline soil, and when in cultivation in an acid soil the quantity and color of flowers is greatly improved by liberal feeding of coal ashes. When seen in full glory in June there is no desire for anyone to exclaim over the super-superb beauties of Oriental wild roses.

PHOTO J. HORACE MCFARLAND CO.

THE WILD ROSE HOLDS CHARM

More than thirty American species equal in beauty to those of Europe.

Our other four eastern roses are much alike in looks, and often grow in fields and along roadsides together. They are very prickly, with bright red stems, and many bright red flowers in June. Though alike, you can learn the differences, and all are sold by dealers in wild shrubs. The Virginia Rose (*R.*

PHOTO J. HORACE MC FARLAND CO.

WHAT THE WILD ROSE MAY DO ABOUT THE HOUSE

Given the care of the Eurasian species, there is no telling what they might achieve.

virginiana, usually sold as *R. lucida*), is very common in the upper half of our Atlantic coast region and the mountains beyond, entirely north of Virginia. The leaflets are very shiny green, and the stout hooked prickles are only in pairs at the base of each leaf. It makes great thickets some six feet high which only a rabbit will enter. In 1878 in the region of Pennsylvania a double form was found called Rose d'Amour, but the flower nods its head, and the plant has very poor growth. Ten petals are quite common in the wild, so doubles could be had for the making.

There is a similar pure white rose with green stems and light green foliage. It is local in the wild, our only white wild rose in the eastern states, and very rare with dealers. They call it *R. lucida alba* (or *R. virginiana alba*), but its true name is said to be *R. Lyonii alba.* The Bristly Rose (*R. nitida*) is less tall, and the whole plant, twigs, petioles and hips, is clothed with orange-red bristles. The two species are often together. Then little Pasture Rose (*R. carolina,* but in most cases called *R. humilis*), is but a foot or more high, the leaves dull above, the twigs with straight paired prickles and many slender bristles. It is like both *nitida* and *virginiana,* but less tall, and usually has but one flower per plant. Try to dig it! Enormous cord-like roots run close to the surface and send up from each joint a slender plant. To plant it is like burying a roll of tangled wire. For a rock garden this is especially suited. It grows with its two sisters, and far to the west and south, the most widespread native rose.

In the swamp, in July, more roses bloom. The Swamp Rose (*R. palustris* now, but formerly *R. carolina*) differs in its wet habitat and later bloom. Yet it is much as *R. virginiana* save that the leaves are thinner, more finely toothed, and pale downy below. Any wet place from Canada to Florida is its home, but as no one grows it in gardens, and it prefers wet solitudes, it is now locally abundant only where man has not yet made his home. If you can identify these four species when found together along a country road, you are an expert at close observation.

Our central states have also the last two (*R. carolina* and *palustris*), and add two more. Little *R. foliolosa* is a sort of improved Bristly Rose. Often there are eleven leaflets, and the bristles few, the paired prickles needle-like. The little pink blossoms are usually solitary, but very fragrant. From its foliage it looks like a dwarf sweet fern, and is especially desirable in the rock garden or for edging shrubbery. Had it no flowers its foliage earns it a place of honor among low shrubs. Few dealers have it for sale.

The other central rose is unique, its nearest relatives being the Musk and other species of the Orient. The Prairie Rose (*R. setigera*) has three leaflets

and long-curving bramble-like stems. It is more a bramble than a rose through the winter and these slender twigs make it very useful as a cover for banks and rocks. In July it bears great corymbs of odorless deep rose blossoms, latest and showiest of wild roses. As a wild species it holds its own well in the craze for new Chinese species. It is the mother of many of our pillar roses (Baltimore Belle, Beauty of the Prairies, Tennessee Belle, American Pillar, and others), and much more can be done with it. The two banner wild roses of our continent are *R. blanda* and *R. setigera,* and once you really see them they are unforgettable.

The rest of the story is less vivid. There are many species of roses in our great western region, few of them in cultivation, not all of them yet finally ticketed by science. Most planted is Prickly Rose (*R. acicularis*), a relative of the Cinnamon, the leaflets downy, even purplish, below. Its special charm is extra early bloom, often coming in mid-May and preceding the precocious *R. rugosa* by several days. It has not the heavy bloom of our *R. blanda* and is finely prickly throughout the plant. *R. woodsii, R. fendleri, R. nutkana, R. engelmanni, R. Sayi,* and others are close relatives and not markedly different.

Most curious are the wild roses of the dry southwest (*R. mirifica, R. minutifolia, R. stellata,* etc.). They are low-stunted bushes of brown branches and many straight brown or white prickles, more like a low gooseberry bush, and the fruit is all prickles like the prickly gooseberry of our swamps. The flowers are purple, rose or white, solitary, more like a strawberry bloom than of a rose. As the bushes are built for heat rather than for frost they are not easy to grow in northern gardens, though they will live and bloom if carefully attended to with a view to the conditions prevalent in their native habitat.

The Bull-frog and His Cousins

THIS old bull-frog seems not to mind having three half-grown spring frogs on his back, and the little fellows, as far as one can judge by their expression, seem to feel perfectly contented and secure on the broad, cool surface of their big cousin's back. But it is very hard for a human being, and we believe not easy even for another amphibian, to tell by his expression what a frog is thinking about. So, although the bull-frog host seems to have a full stomach, and may not feel like dining, we would advise the little fellows to take care not to wander within reach of the big one's mouth, for bull-frogs are somewhat careless regarding their food and might gulp down a little frog or two without experiencing any regret.

PHOTO CORNELIA CLARKE

WHAT DOES THE BULL-FROG THINK?

Big and little they seem contented; but if the big fellow gets hungry beware.

The bull-frog (*Rana catesbiana*) is our largest species, frequently having a body length of from six to eight inches. It inhabits most of the United States east of the Rocky Mountains and southern Canada, and attains its greatest size in the southern states. On account of its large size it is the species most sought after for its flesh. It can usually be distinguished by the relatively large size of the tympanum or ear, the circular structure back of the eye.

The spring frog (*Rana clamitans*) reaches a body length of three or four inches, and in general resembles the bull-frog in looks if not in size.

The Pointer

By HORACE LYTLE

IT IS unfortunate that there should have developed two distinct factions among the fanciers of the various breeds or strains of bird dogs. Yet it is so and we have the bench show enthusiasts on one hand and the practical field men on the other. The fact remains, however, that the bird dog, be he Pointer or Setter, should be of practical value in the field. If he cannot do that work for which he is intended, of what value are his mere looks when posed upon the carpet? Of what real consequence is the indoor fancier's opinion either of the dog's natural beauty or his artificial manner of posing on the bench?

The most fortunate happening for many a day in the realm of the bird dog, therefore, was the outstanding win of the Pointer dog, Governor Moscow, at the recent forty-ninth annual show of the Westminster Kennel Club in New York. Governor Moscow is said to be a very good dog in the field, so the practical fanciers of his breed hail his bench show win with proud acclaim.

In the heart of New York City, before one of the largest galleries that ever beheld a dog show in any land, in competition with approximately two thousand of the best dogs America ever produced, Governor Moscow, the Pointer, was proclaimed the best of them all. By this feat he becomes the bench show champion of champions for 1925. Not in twenty-five years has one of his breed won this honor.

We are moved to hope that Governor Moscow, by his achievement, may prove the means of attracting more and more attention to his richly deserving breed. In truth, popular as all the bird dogs are, they do not enjoy one-tenth of what is due them by right of superlative merit. They are workers, every one of them—practical, serious, sensible dogs with a mission in life—loyal, lovable, wonderful dogs with the heart and the head to make the best sort of pals on earth.

Arrayed on benches at the dog show, the dog lover may be able to observe more intimately the various qualities of the animals, but it is in the field trial that the bird dog exhibits all that is in him. Such trials are held frequently throughout the country, local and national in scope. They are designed to test the speed, range, style, bird sense, character, courage, nose, judgment and willingness to obey the will of the handler, at the same time showing independence in seeking likely places for game. These are practical workouts for the dog, during which they are tended by a handler who must maintain contact with his dog and whose dog must, if he be successful, maintain contact with his handler. Field trials are run in heats, a brace of dogs at each time, gradually eliminating dogs down to the three or four that place in the lead in the opinion of the judges.

PROSPECTIVE CHAMPIONS

A pointer is always a pointer, young or old.

All dogs have a certain amount of brain power, but in the bird dogs it is developed to the *n*th degree. They *think,* just as fast as you do, often much faster. There is a story of the great Pointer, Fishel's Frank, and what probably lost him first place in the field trials held at Washington Court House during October of 1906. After running an outstanding heat in his first series, he was called back to run with Pretty Peggy in the second series. As the result of a fast, wide and intelligent cast, his nose found the scent of quail and he soon "froze" on one of his most stylish points. His handler called "Point," and then proceeded very slowly to ride toward his dog. He seemed to have utmost faith in Frank's stanchness, and was making a grandstand play by taking his time. Before

CHAMPION BECKY BROOMHILL

One of only two dogs in Field Trial history to win the National Championship three times.

going in to flush the birds, Jack Gude, who was handling, stopped to jest with some of those in the gallery—thereby committing the most fatal error—for just then Fishel's Frank jumped forward, flushed his own birds, and proceeded to chase them away. His whole manner seemed to say: "All right, I've done my duty hard and seriously—to the best of my ability. But if you're going to take it as a joke, I might as well have my fun out of it, too."

Nick Daniel was once judging a field trial in which a similar situation arose. The central figure this time was a dog named Spot's Rip Rap. He was about to conclude a heat of such brilliance that only the most flagrant error could possibly rob him of first place. It seemed out of the question that such a thing could occur. The running time had just about expired when suddenly Spot's Rip Rap made a magnificent find and assumed one of his customary attitudes on game. Like a statue he stood out in bold relief against the sky line, and every last man in the gallery was thrilled as they rode toward this crowning and concluding point. And then, without an instant's warning, Spot's Rip Rap did exactly the same thing as Fishel's Frank—and deliberately flushed the birds he was pointing!

That evening the dog's handler went to Mr. Daniel and said: "Not in any way as an excuse, but just merely to let you know why that happened today, I want to explain. Last evening I had occasion to punish Rap. He deserved it, but perhaps I did make it just a bit too severe. Well, that flush today was his way of getting even."

Recently I had the pleasure of running a couple of my dogs with two splendid Pointers belonging to Mr. R. R. Dickey, who formerly owned one of the greatest Pointers of all time, Champion Alford's John. Even today they still quote the performances of this outstanding Pointer whenever field trials are discussed. "My *Old* Dog," as Mr. Dickey always speaks of him, will always rank as one of the brainiest bird dogs of all time.

ON POINT

There is a thrill when the bird dog shows his style.

We fell to discussing Alford's John. Mr. Dickey told of his ability to jump fences, relating a story that indicates the bigness of his brain even more forcefully than it does his ability to clear any fence that might obstruct his path while hunting. In one of his important field trial races, Alford's John was braced with a dog that was fast but inferior to John as a bird finder. For a long time John's bracemate "trailed" him, hoping to share in one of the Champion's finds. He was just fast enough so that John did not seem quite able to shake him off.

Finally he came to a very closely woven, high fence. John promptly jumped it, clearing the top nicely. His competitor was afraid to try it, and thus John managed to get rid of him. The sequel of the story, however, is the uncanny part. No sooner had John "lost" his bracemate than he returned

PHOTO KADEL AND HERBERT

GOVERNOR MOSCOW

Pointer, winner at the Westminster Kennel Club Show over the largest field of any show.

very close to the spot where he had first jumped the fence, jumped back again, and quickly pointed a bevy of quail. It must have been that he had winded those birds before, but refused to point them while the other dog was close enough to share in or try to steal the point.

Although it is only during comparatively recent years that the Pointer has been able to hold his own with the Setters in field trials, nevertheless he represents a very old breed, the origin of which was in Spain. We do not know just how long he had existed in Spain before he was introduced to the British Isles, but we do know that there were Pointers in England during the seventeenth century.

The rise of the Pointer during the last thirty years is remarkable. From a breed inferior to the Setter, he has come to be the more widely popular of the two—and his record of late years is matchless. The first Pointer ever to win the National Championship of field trials was Manitoba Rap, in 1909. Since his day the record of his breed has been growing constantly brighter. Only two bird dogs in all history have ever won the National Championship three times, and both of these have been Pointers—Mary Montrose and Becky Broomhill. Surely such a brilliant record speaks for itself even to the layman in dog knowledge.

It is true, I think, that Pointers are developed with less effort and more quickly than the Setters. This is greatly in their favor from the standpoint of pleasing the professional handlers. Perhaps the most correct theory of the real reason behind all this is that *the Pointer breeders have never followed fads.* That is not the case with the Setter men. A Pointer is always a Pointer. The Setter men would never have bred to a dog like Alford's John, no matter how good an individual. Yet it is because the Pointer men did breed to Alford's John that the Pointers are beating the Setters today. Think it over, those of you readers who may be numbered among the fanciers.

At all events, if you own a good bird dog, whether it be Pointer or Setter, you will find one of the finest friends on earth; and if you have a good one that runs fast and wide and stylish, you will have a real incentive that will surely call you to the fields to enjoy the thrills that always come from watching a "class" dog work. I know of no greater—no cleaner—sport than field trials, a sport that shows the practical side of the companionable bird dog.

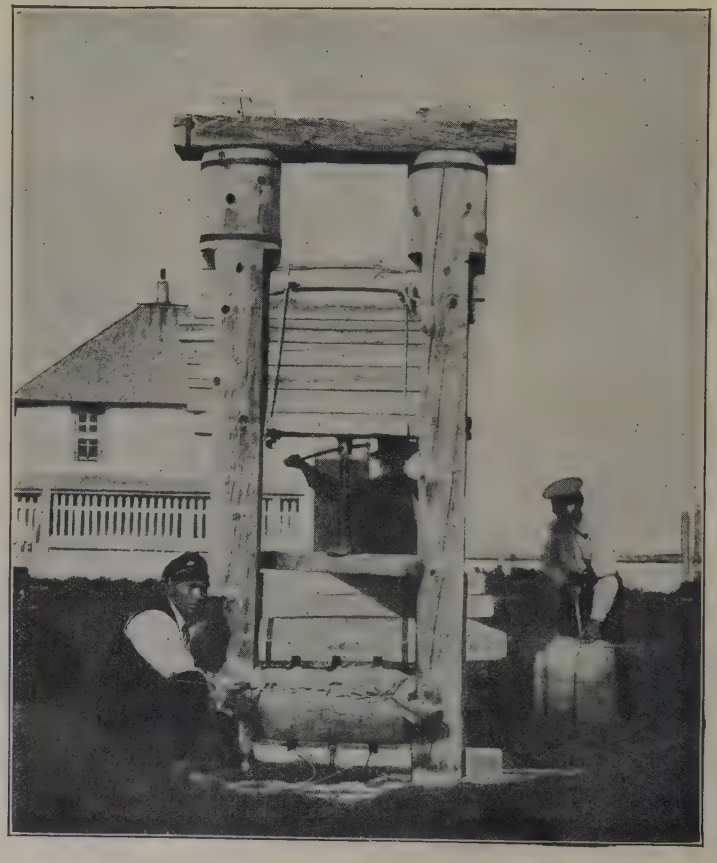
Leisurely Advancement

By Madge Macbeth

THIS OLD fur press stands at a northern post, and has been in use longer than the memory of the oldest inhabitant.

The method of procedure is as follows: A piece of canvas is spread on the platform — only just slightly raised from the ground. Upon this the skins are placed, and when the quantity is found to be sufficient, they are compressed by a very strong lever. This has a pressure of about a ton, and the bales weigh something like one hundred pounds.

A piece of canvas is laid over the top of the fur just prior to the pressing and while the block is down, the two pieces of canvas are sewn together.



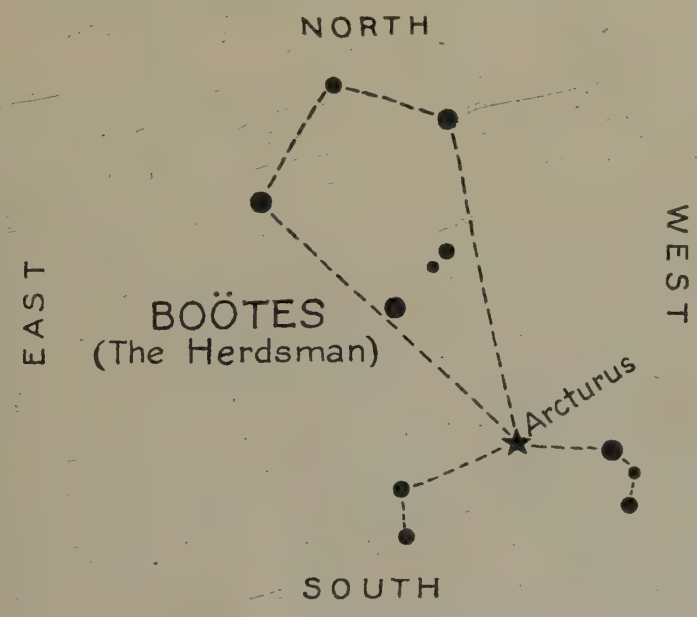
A year or so ago, while the press was being operated, the pole used for a lever, on which half a dozen languid braves rested, broke under the strain. A jack was then substituted, marking a step forward in the methods of operation. In these remote regions, where for more than a century the routine has varied but little, changes are slow. With the advancement of wages due to competition, however, and the introduction of steam and electricity, a leisurely but certain evolution is taking place in many methods and contrivances of early days.

Boötes in the Evening Sky

By ISABEL M. LEWIS

BEFORE we turn to a study of the evening skies for this month of June let us make the acquaintance of one of the constellations that stands out prominently in the heavens. Let us consider Boötes, The Herdsman, which will continue to be visible in the evening hours throughout the summer.

Boötes is easily found because its chief stars form the outline of a boy's kite, with the bright orange-colored star Arcturus at the point where the tail joins the body of the kite. This kite has two tails, however, extending to either side from Arcturus. Some prefer to see the five fairly bright stars in Boötes to the north of Arcturus as corners of a pentagon, a five-sided figure with its sides of equal length. You may, of course, picture it any way you wish, the dotted lines that connect the principal stars of the constellation being used only to trace an outline that will be easily recognized and so help one in finding the constellation.



Just a word now about Arcturus. Its peculiar orange color makes it easy for us to find this star. It is also one of the three brightest stars north of the celestial equator. The other two are Vega, now far over in the northeast, and Capella in the northwest. The three stars differ greatly in color, for Vega is bluish-white; Capella, yellow; and Arcturus, orange. Vega is a shade brighter than the other two which are exactly equal in brightness. Arcturus is one of the nearer stars to the earth though there is some uncertainty as to its exact distance. It is placed between twenty-one and thirty-six light years. You know a light year is equal to about six million million miles and is the distance light travels in a year at the speed of 186,000 miles a second. Arcturus is also quite a giant sun, the stars being all suns, of course. Its diameter is nearly twenty million miles. That makes our sun with its diameter of only 864,000 miles look pretty small, though compared to our planet Earth, with its diameter of 8,000 miles, it seems large.

Now let us turn to our June skies. June is the month when Virgo, The Virgin or Maiden, goddess of the harvest, will be found on the meridian in the southern sky. Spica, its beautiful first magnitude star, represents the wheat-ear that the maiden holds in her hand, symbolic of the harvest. It lies nearly due south at nine p. m. the first of June.

Virgo is the largest of the twelve zodiacal constellations through which the sun, moon and planets pass in their circuit of the heavens. They are identified as the constellations through which the ecliptic passes. In Virgo lies the crossing point of equator and ecliptic where the sun is to be found on its southward journey at the beginning of fall, in September. Also in Virgo we now find the beautiful planet Saturn, yellowish in color and brighter than Spica, and some distance to the east of Spica.

During the month Saturn will move slowly westward in the direction of Spica a distance of a little more than a degree.

While we are viewing this part of the heavens look toward the southeastern horizon for the fiery rays of Antares, rival of Mars, in the constellation of Scorpio, The Scorpion. This star, as you may know, is considered to be far the largest of all the giant suns of the universe. Jupiter, the largest planet of the solar system, is now in Sagittarius, next to Scorpio on the east, and though below the horizon at nine p. m. the first of June we will find it coming into view about this time the last of the month.

June also is the month to look for the Big Dipper high in the northern sky with the end of the handle nearly due north at the time we are considering. Boötes, which is generally spoken of as The Herdsman, is also known as The Ox-driver, and is supposed to be driving the seven plough oxen, as the seven stars of the Big Dipper are also known, around the north pole of the heavens. Arcturus, the brightest star in Boötes, is The Bear-guard, as its name signifies, and it can be easily found by prolonging the line of stars in the tail of the Great Bear or the handle of the Big Dipper toward the southeast. Some see in Boötes a hunter pursuing the Great Bear with his two hounds, Canes Venatici, by

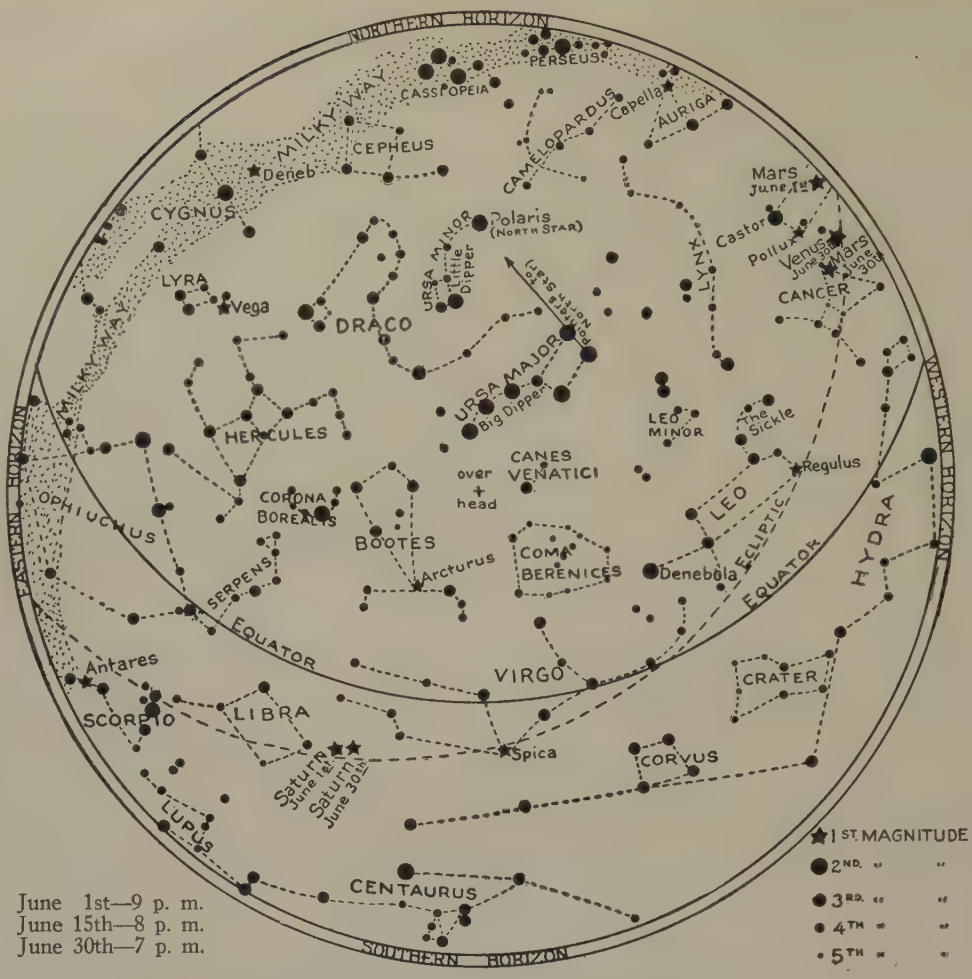
name Asterion and Chara, the latter being the more southerly and brighter of the two stars.

Corona Borealis, next to Boötes on the east, is The Northern Crown, and it is indeed a beautiful little crown of six stars in which the second magnitude star, Gemma or Alphacca, the brightest star in the semicircle is the jewel in the crown.

Far over in the northeast is Vega, brightest star of the northern hemisphere of the heavens, easily recognized by its diamond-like blue-white splendor and by the two small stars that form with it an equilateral triangle that has no counterpart in the heavens. Vega is in Lyra, The Harp, one of the smallest and most interesting constellations in the sky. It lies next to the huge constellation of Hercules which separates it from Corona and Boötes on the west.

Another small constellation that is easily recognized is Corvus, The Crow, one of the two Riders of Hydra, The Water-snake, which now fills all of the southwestern heavens below the constellation of Leo and Virgo. Corvus is identified as the little quadrilateral of stars with its corners marked by stars of the third magnitude. It will be found not far from Spica on the southwest.

In the western sky this month we will still find Leo, The Lion, with its gleaming Sickle and Regulus, its brightest star, approaching the western horizon. The huge equilateral triangle with its three corners marked by Arcturus, in Boötes, Spica in Virgo, and Denebola in the tail of Leo is still a conspicuous configuration in the evening sky and now lies across the meridian to the south of the zenith, or point overhead.



Hold over the head with top toward the North.

The planet Mars which has been visible in the evening skies for many months is now drawing in close to the sun and will be seen low in the west this month. It will pass from Gemini into Cancer during the month and by the last of June will set less than two hours after the sun.

Venus which passed into the western sky the latter part of April has been too close to the sun to be visible up to this time and it will not be far enough from the sun to be picked up in the twilight until the latter part of June when it will be found a few degrees to the west of Mars in Gemini. During the summer it will draw farther and farther away from the sun and become an increasingly beautiful object in the western sky after sunset.

On the twenty-first of this month the sun will reach its greatest distance north of the equator in the constellation of Gemini. This will be the longest day of the year in the northern hemisphere and will mark the official beginning of summer.

Thunder clouds are gathering in the west. Lightning flashes. In the July number the subject of Mr. Charles Fitzhugh Talman's entertaining weather article will be "Lightning Facts and Fancies."

The Counselor and the Camp

By WILLIAM GOULD VINAL
Professor of Nature Study, R. I. College of Education

GETTING a job as a counselor at a girls' or boys' camp has been a mad rush and a gamble. It has been somewhat hit or miss, and this article is primarily an analysis of what counselorship is and should be, and, secondarily, a guide to the would-be counselor in summer camps. There is a dire need of a counselor clearing system, however, to bring order into this work, which is growing apace in scope and importance.

A camp counselor is not an errand boy, or simply an employee with wages and time off, nor is he taken for a rest cure. A counselor is a red-blooded leader who is interested in children and the out-of-doors; who, seeing the challenge of this new profession, has enrolled in the camp program to do his bit in child development.

The usual leaders in camps are in the fields of art-craft, camp-craft, dancing, dramatics, singing, swimming, out-door cooking, nursing and nature-lore. Because one is accomplished in the technique of one of these specialties is no guarantee that he is a good counselor for a camp. I know of a song counselor—a graduate of a well-known conservatory of music—who, on the first day of camp, examined every camper as to voice and ability to sing the chromatic scale. His summer's program failed the first day. The next summer a college trio came from Dixie. They just sang and sang. The campers caught the spirit and the camp became known as a "singing camp."

SWIMMING IS AN IMPORTANT ACTIVITY
The physical obligations of a camp counselor are clear-cut.

Many instances of lack of qualification and square pegs seeking round holes could be cited in connection with this question of counselorship. But let us get down to brass tacks. Let us list ten qualities that a counselor should possess as his stock in trade.

Prospective counselor, total yourself up. A good way to obtain your measurement is to have several honest friends write down a per cent for each of the qualities on the basis of ten. If the total adds up to 90–100 per cent it shows a very promising outlook but, of course, does not guarantee success, for it is by their results that we shall know them. If the average is 80–90 per cent the chances of success may even then be fairly good. In this case there should be a second reckoning to discover the possibility of cultivating new habits. For example: The candidate who scores 4 per cent in social background can, by conscious effort, learn correct English, acquire clean habits, and practice common courtesies. The remedying of a bad habit requires intelligent treatment and the time required may be a matter of years—depending upon the malignancy of the case and the persistency of the sufferer.

First, we have good social background, meaning the "everyday" qualifications. Is personal cleanliness habitual? Does the candidate use correct English? Does he know and practice the common courtesies of life? Is he companionable and unselfish or is he "the only child" kind? Is he humble or conceited?

Love of children comes next. Counselors are sometimes "misfits" because they do not distinguish between a mere interest in children and a love of them. In camp the counselor lives with the boys or girls. They are playmates. How many children look up to you as a pal? If they do not do that now, what reason do you have to suspect that they will when you get to camp?

Third, the power of moral guidance is essential to a counselor, who must have the character that discriminating parents wish their children to emulate. It is not enough to be physically wholesome and mentally clean. A counselor must be a genuine character builder. He must have rock-

COUNSELORS MUST COMBINE MANY QUALITIES

Attributes of leadership, good background, physical fitness, camp knowledge and love of Nature are among the essentials.

bottom courage to say "no" or "yes" at the right time. His trustworthiness stands the test even when acting quickly as in a game. His decisions are fundamentally just and firm.

Counselors should, fourthly, be mature enough to guide yet young enough to enjoy participating in the various camp activities. Campers go to him as an advisor and he respects their confidences.

An attractive personality is as important as is knowledge. I would rather have a leader with an attractive personality than a person with a whole encyclopedia of knowledge and no magnetism. Most important is the sunny smile—sort of a "laugh and the world laughs with you" personality—the ability to enjoy a hike when caught in the rain—to come through joyful with a blister on your foot. A keen sense of humor is vital, and he must have a sympathetic heart—generous at the right time and firm when necessary, plus a generous supply of loyalty. Can stand the test of being adaptable, i.e., can change plan from sunshine to rain or daylight to darkness.

The physical obligations of the counselor are clear-cut. He must have the ability to lead on hikes, to run in play, to climb hills, to paddle a canoe, to assist in swimming. It is potent for him to set the example of erect carriage, and good health habits. He must know how to adapt hikes and games to the individual needs, the dangers of violent exercise, the relation of exercise to meals, the value of corrective work. The physical qualities of a counselor are clean, sound health habits, tested endurance, reserve energy and a will to safeguard the same.

A person who does not have an enthusiastic love of the out-of-doors has no place in camp. He becomes a liability rather than an asset. He should have a real interest in plants and animals. He should love to assist the swimming counselor—the nature counselor—and so on—each in turn. He should know the common camp laws of the trail. He must have an honest belief in nature ideals. He must be a protector of all wild life.

Directors have unanimously decided that the best counselors come from the ranks of the campers. It is equally true that the majority of applications come from those who have never camped. The first preparation for counselorship is to attend a well-organized camp.

The knowledge of camping is an indispensable asset. The counselor, above all, must be perfectly at home in all kinds of weather. He must possess a certainty in picking a camp site, making a fire, and organizing a meal, for his assurance radiates on the group. If he is not a master of fire building and first aid he should never be given the charge of a trip. He must recognize these responsibilities.

A good counselor should be at least as accomplished as a good camper in any department of camping. He should have a fund of nature enjoyment and at least an amateur understanding. He should be able to point out some nature things well. He should realize that the art-craft department presents an opportunity and be eager, if his time from duties permit, to utilize the equipment. He should recognize that games have a place in the program and whenever convenient should enter in for the sportsmanship of playing. He should have a few campfire stories which he can tell in his own words. He should join in the camp songs. He should be in for the fun of "getting up a show." His camp training of earlier days has made him an all round camper. Many would-be counselors, in

(Continued on page 381)

A Glance at Nature Study in Honolulu

IT IS somewhat difficult to estimate just how much nature study is now being taught in the schools of Honolulu. This subject has had ups and downs here as elsewhere. However, hoping to fathom the depth of the fountain head, we spent a morning at the Normal School where Miss Emma Davis has under her instruction the seniors and juniors of the classes preparing to teach in the grades.

This experience was reassuring. In a large pleasant classroom we found tables and window sills and shelves well filled with living material that covered a fair amount of the subjects available for the biological nature study of the region. There were some forty or fifty tropical plants, shrubs, and trees represented by branches with leaves, blossoms or fruit or both —all named for our benefit, and a gorgeous show it was. The wealth of plant life here is enormous and its beauty quite beyond description.

On the window sills were various balanced aquaria; especially interesting were those containing the tiny fishes native here and the introduced species that feed upon mosquito larvae. Some contained strange-looking pond snails; one contained a turtle and in another was a brave attempt at making a balanced salt-water aquarium. Everything was labeled plainly so that the names should become familiar to all the pupils.

The insect work consisted of collections of common insects arranged by the pupils in Riker mounts; and what we found more interesting were some mounts showing the complete life history of several insects, notably butterflies. Each of the early stages was preserved in a vial and placed in one corner of the mount. In connection with these were carefully taken notes concerning each stage. We were particularly pleased over the exhibit of cages for living insects made by the pupils themselves. These consisted of various sized boxes, some of wood and some of pasteboard with sides and covers of wire screen. Several contained happy caterpillars of the monarch butterfly, which is very common here, gorging themselves on the native milkweed which is a beautiful large shrub with lavender blossoms.

The[illegible] mounts of seeds [illegible]ies and [illegible] inter[illegible]

bead leis or necklaces which are made so beautifully in these islands and are greatly appreciated by the tourists. It is surprising to see how many plants, trees, and shrubs contribute seed available for this artistic industry.

Another interesting exhibit were boxes containing collections of shells found upon the seashore here. The boxes were shallow and partitioned into compartments of suitable size. In one was a goodly number of the shells of the delicate tree snails for which this region is famous. All of the shells bore labels giving the names of the species, for Miss Davis is careful to help her pupils to learn to distinguish correctly all the various forms of life.

The notes made by each pupil concerning the special thing she was studying form a very important feature of the work. Incidentally it is interesting to note that there were only a very few of the Anglo-Saxon race among the pupils, who were largely Japanese, Chinese, Korean, Hawaiian, with some Portuguese; and incidentally we also noticed that a handsomer or more charming lot of girls we have never seen in any Normal School in the United States.

The [illegible]

(Continued from page 380)

their own estimation, can fit in anywhere. All they need is the opportunity. It is true that a good counselor is an all-round camper. It is equally true that he should have the gift of doing something unusual. Every group of young people finds some one counselor toward whom they gravitate with the usual request "to do something." This counselor is a good entertainer. He directs conversation. He possesses originality. And along with this should go the unusual knowledge and ability in one of the nine departments of camping already named. He is coun-

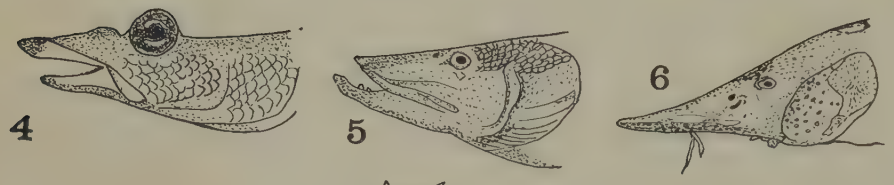
selo[illegible] ca[illegible] tra[illegible] so[illegible] kn[illegible] po[illegible] po[illegible] se[illegible] H[illegible] le[illegible] st[illegible] hi[illegible] m[illegible] is[illegible] st[illegible]

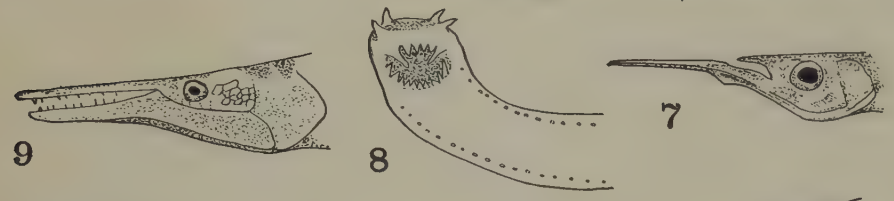
[illegible]ross to young people. He knows [illegible]ild nature. He is so enthusiastic [illegible]out his own work that the campers [illegible] it by contagion. Everyone about [illegible]n feels a thrill. He is enterprising. [illegible] is firm. The group obeys. He de-[illegible]lops leaders within the group. He [illegible]s initiative and a goodly measure of [illegible]ct. He knows what to do in an [illegible]nergency. He changes his plans [illegible]heerfully.

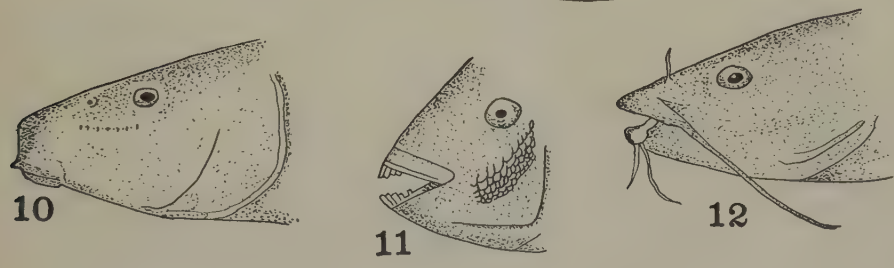
By now you may have decided your [illegible]ourse. If you are not fitted for the [illegible]ork you cannot afford to waste the [illegible]mper's time and opportunity.

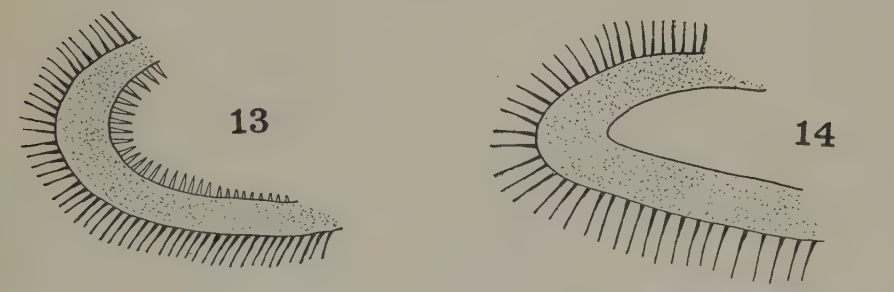
Practical Nature Puzzles

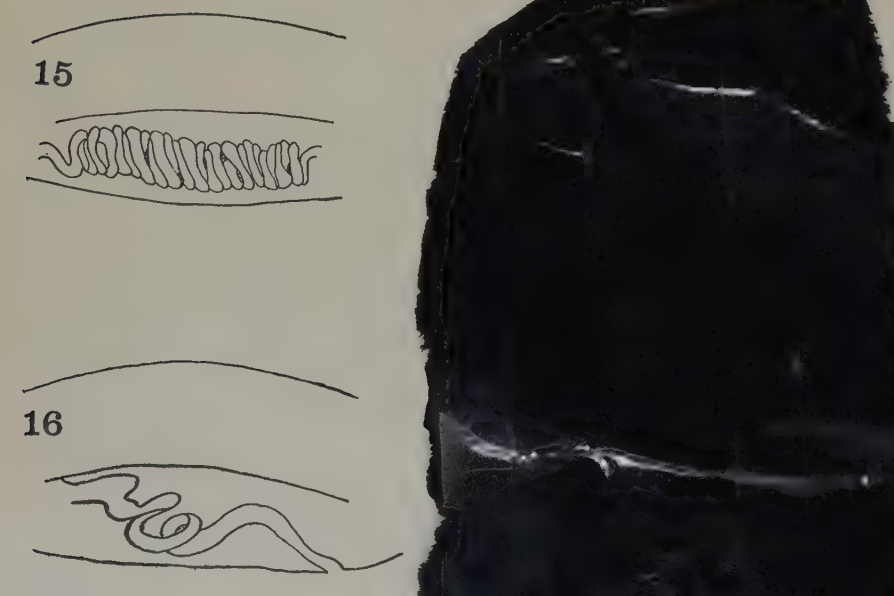
By E. LAURENCE PALMER











FURS, feathers and flowers have been responsible for these puzzles for the last three months. This month it is fish and next month it will be frogs and their relatives.

The environment in which fishes live demands considerable variation in the form and structure of the creatures which may live in it. A fish that lives in a still pond may very easily be unable to thrive in a dashing mountain torrent. A fish that may be invisible to its enemies over a clear sandy bottom may be conspicuous among weeds. A fish that flies must be different from one that does not and a fish that eats other fish for food must differ from those which get their food from mud sucked in.

Fish must eat to live and most fish must see their food to secure it. Nos. 1–4 show how fish vary in regard to sight organs.

1. Which of these belongs to the star-gazer that lies on the bottom and captures from beneath the prey it sees above it? ( )
2. Which belongs to the blind fish that lives in dark caves where it could not see because of lack of light? ( )
3. Which head belongs to the four-eyed fish, a killifish which feeds upon insects at the surface of the water? ( )
4. Which head belongs to the sunfish that feeds for the most part between the surface of the water and the bottom of the pond? ( )

The position of the mouth may also tell you something about where certain fishes find their food as shown in numbers 5–7.

5. Which of these belongs to the pike that feeds for the most part between the bottom and the surface? ( )
6. Which belongs to the halfbeak that feeds at the surface? ( )
7. Which belongs to the sturgeon that feeds entirely at the bottom? ( )

8–12 show other modifications of the mouth regions such as the kind of teeth, lips and accessory structures.

8. Which of these belongs to the sucker that sucks in soft mud from which it extracts its fine food? ( )
9. Which belongs to the bullhead that is able to detect food in mud without taking the mud into its mouth? ( )
10. Which belongs to the hagfish that attaches itself to other fish, bores into their bodies and destroys them? ( )
11. Which belongs to the sheepshead that can tear shells loose from the rocks and eat the soft parts within? ( )
12. Which belongs to the garpike that feeds upon large fishes as well as upon small and captures them in open water? ( )

After food and water enters a fish's mouth the water is generally expelled through the gill openings leaving the mouth largely filled with food. The nature of these gill openings often tells much about the food of fishes as shown in 13–14.

13. Which of these belongs to the sucker that strains out fine food from the mud? ( )
14. Which of these belongs to the pickerel which feeds upon large foods? ( )

After the food has been swallowed it must be digested. Those that feed upon animal life have a different problem before them from those that feed upon plant life. The development of the intestinal tract may be suggested in the picture of a dog which is an animal-eater and of a cow which is a plant-eater.

15. Which of the intestinal tracts of fishes shown in 15 and 16 belongs to the fish-eating sunfish? ( )
16. Which of the tracts shown belongs to a mud-eating minnow? ( )

Fishes not only eat but they must protect themselves. They do this by many means, among which is the coloration of their bodies so that their enemies beneath them cannot see them nor can their enemies from above.

17. Which of the fishes shown in numbers 17 to 20 is or are right side up? ( )

Human beings are not the only creatures that show their age. Some fishes show their age by rings on their scales. They do not put down a ring each year as do trees. You may figure this out for yourself when I tell you that number 21 and 22 were taken from two salmon, one in its fifth year and one in its fourth year.

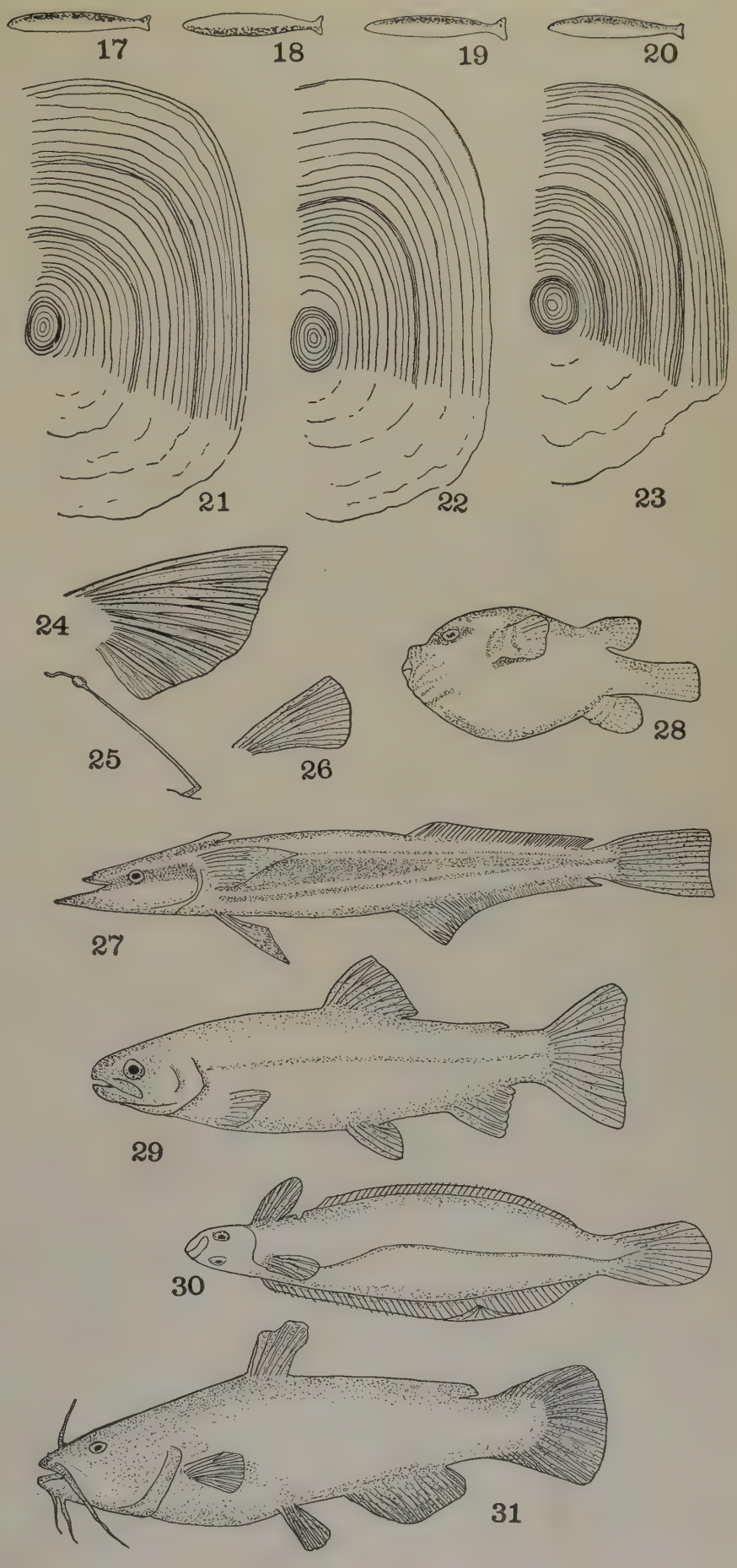
18. Which scale is from the salmon in its fifth year? ( )
19. Which scale is from the salmon in its fourth year? ( )
20. In what year was the salmon whose scale is shown in number 23? ( )

In numbers 24 to 27 are shown a few variations in the forms of fins of fishes. To be sure all those shown are not from similar fins but their structure is so evident that you should have little difficulty in making your decision. In number 27 I refer in particular to the fin on top of the head.

21. Which fin belongs to the angler fish that dangles a bait-like structure before its own mouth to attract little fishes? ( )
22. Which fin belongs to the remora that attaches itself to the side of other fishes like sharks and thus gets a ride? ( )
23. Which fin belongs to the flying fish that is able to parachute for a considerable distance after getting a start by swimming rapidly? ( )
24. Which belongs to a perch which changes its direction and raises or lowers itself in the water as it chooses? ( )

The form of fishes often tells us much of their habits as shown in numbers 27 to 31.

25. Which of the fishes shown is the flounder that lies flat upon the bottom and swims but little? ( )
26. Which of the fishes shown is the globe fish that swims slowly in still water? ( )
27. Which of the fishes shown is a trout that is a most excellent swimmer and is at home in swift water? ( )
28. Which of the fishes shown is a bullhead that is more or less sluggish in its movement in the still waters where it is at home? ( )
29. Which is the shark-sucker which rides attached to other fishes? ( )



Hints to Nature Readers

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers and other readers on how to use them, is proving most helpful in Educational Work

The Surf Scoter Here is an intimate and colorful account of the sturdy indomitable sea duck known as the surf scoter. His contour and livery distinguish him easily from his more graceful inland cousins. His diet excludes him from our list of table delicacies; but his digestive powers place him first among performers of gastronomic feats. The flightless condition during the moulting season results in depletion of numbers among the males. A related species nests in North Dakota where it is protected in the Federal bird refuges of the Stump Lake Islands. All this and more is set forth with delightful humor which readers of Junior High School age and over will find truly entertaining. For little folks who are getting acquainted with barnyard ducks the story of the scoter retold very simply, and illustrated with the pictures here given, will broaden the horizon of duckland.

* * *

Avalanche Lily and Her Cubs Bears, found in every zoo and circus and constantly met by tourists in our National Forests and National Parks, are amusing subjects for observation. Scarcely less interesting than first-hand acquaintance are such true stories as "Avalanche Lily." There are maternal solicitude and care, adroitness, roguery, playfulness, lusty appetite, strength, self-sufficiency—in short, all that makes a bear a bear—woven into the narrative.

* * *

Our Roadside Roses The native rose which grows wild in one's neighborhood is worth attention. Our American wild roses are so beautiful, and so easily grown that they merit a place in every rose garden. They are easily distinguished by the pair of wide, flattened-toothed false leaves at the base of the leaf petiole, and by the rose hips which are different from any other fruit. American wild roses may be grouped in three geographic areas. The best varieties of each section are herein described.

The first Nature Study Bulletin of the American Nature Association, jointly with the American Nature Study Society, is now available. It contains reports of committee work and abstracts of addresses at the annual meeting in Washington, D. C., last December. Copies of this Bulletin may be secured for twenty-five cents by writing to the Nature Study Department, NATURE MAGAZINE, *Washington, D. C.*

This publication gives report of a survey of nature study teaching in the cities of the United States; also of a survey of state programs; also one of the situation in teacher-training schools both as regards the training of teachers in nature study and nature study teaching in practice schools.

The May Flies' Dance of Death If in the brief interval when May flies abound they may be studied in the open or a few secured for observation in a cage, no more exquisite Nature lesson is possible. The fragility of form, the dainty freedom of movement, the disregard of food, the abandon with which it meets death in the accomplishment of its reproduction make this ethereal creature seem scarcely of the earth. To trace its life story from the egg through the larva and nymph stages to the adult fly is to see unfold a fairy tale, for no transformation wrought by a magic wand could be more unbelievable.

* * *

The Pointer Anecdotes of famous Pointers illustrating their keen intelligence add zest to this account of the Pointer's rise during the last thirty years. The ease and quickness with which they have been developed is attributed to the fact that breeders of Pointers have never followed fads.

Air and Its Dusty Freight The sea of air in which we live is a far more interesting phenomenon than most persons realize, as this article abundantly proves. In it the author tells the composition of air, its weight, ways of using it recently discovered, the importance of ventilation and air-conditioning, the quantity and sources of dust in the air, and the instruments devised for counting the number of dust particles in samples of air. Junior High School classes should refer to it when studying the atmosphere.

* * *

The Furry Muskrat If the muskrat is not already an old friend this article will make him so. It acquaints one with Jerry's family tree, and takes one into the interior of his home so that upon emerging it would be possible to draw up plans for such a lodging. It gives one entrée to muskrat society in the winter season, and initiates him into the intimacies of the nursery. Both youngsters and grown-ups in reading it must inevitably develop a sympathetic interest in this little fur-bearer, which will be further strengthened by the excellent pictures.

* * *

Indian Pipe, a Beautiful Degenerate The Indian Pipe, a plant which makes its living at the expense of others, is an object lesson in the loss of power and development through disuse. Because of its odd ghostly beauty it has been much preyed upon by human admirers.

* * *

Armadillo, Armored Grave Digger This article presents an interesting study of an odd member of the animal world. It opens the door to an immense amount of comparative study in mammal development. The protective armor with which this odd creature is equipped instead of other means of protection suggests study of Nature's way of endowing her creatures.

Order Now~ before the Leaves turn!

NOW!

is your Last Chance to buy these lovely

HARBINGERS OF SPRING

Will be barred from import January 1, 1926

Plant them freely through your lawns, shrubbery and perennial borders and rockeries. They will yield rich dividends of pleasure as they increase in beauty and numbers from year to year.

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SPECIAL—100 Crocus, four named varieties. **$2.50 a 100.**

CAUTION—These prices hold good **till July 1—only**

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100 First Quality Bulbs $3.75

Choicest selection of latest and most beautiful Nasturtium-shaded varieties, including the lovely Primulinus or Orchid Gladioli. Better double the order if you have room for them—you won't have a bulb too many.

N. B.—Send for our **Import Bulb List,** full of many other entrancing bulb offers.

Schlings Seeds

618 Madison Ave., North, New York

Novelty and Loveliness in Waterlily Blooms

NATURE never produced flowers more lovely than Waterlilies, and none give a greater touch of novelty to the garden. Day-bloomers and night-bloomers fill all the hours with beauty and fragrance.

The Pring Trio of Tender Lilies

Three varieties from the Missouri Botanical Gardens—all introduced within the past half-dozen years.

General Pershing. The finest pink Waterlily.
Mrs. Geo. H. Pring. Extra large; pure white.
Mrs. Edwards Whittaker. Lavender blue.

One Plant of each variety $12.50

The Jersey Trio of Tender Lilies

Three of my own introduction for tubs or pools.

Dauben. Very light blue; sweet scented.
Mrs. Woodrow Wilson. Lavender blue; stamens yellow.
Panama-Pacific. Rich rosy red, or reddish purple.

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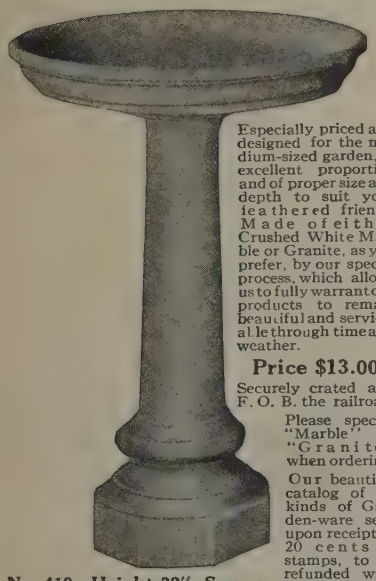
Send for catalogue giving complete cultural instructions and list of other varieties

WILLIAM TRICKER, Waterlily Specialist
669 FOREST STREET **ARLINGTON, NEW JERSEY**

The "Bob-o-link" Bird Bath



Especially priced and designed for the medium-sized garden, in excellent proportion and of proper size and depth to suit your feathered friends. Made of either Crushed White Marble or Granite, as you prefer, by our special process, which allows us to fully warrant our products to remain beautiful and serviceable through time and weather.

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"New Plant Life"

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1 Teaspoonful in 1 quart of water when watering plants.

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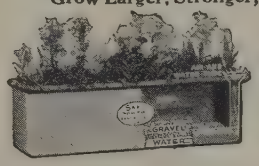

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That Bloom This Summer

Tender Lilies, set in June or early July, should bloom in August. A half-barrel, or a pool, is the "garden" for Waterlilies.

Surprise Collection

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Brand's Peonies

Acres of Beautiful Blooms

The above view of one of the Brand Peony Farms was taken the last week in June, 1924, a week after the National Peony Show at Des Moines, Iowa.

The World's Most Beautiful Peonies

NEVER before in our more than fifty years growing peonies have we had the unusually large assortment of those wonderful choice varieties we are offering for fall planting. Flowers from this stock, competing with those entered by all other growers, won the three highest prizes at the greatest National Peony Show ever held.

Brand's Peonies awarded Gold and Silver Medals at National Peony Show.
Brand's Peonies awarded Grand Sweepstakes at St. Paul Peony Show.
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You will want some of these, the world's choicest and most beautiful peonies, for your fall planting, therefore, write to-day for Brand's FREE catalog of Peonies and Iris, giving varieties with full description, and prices.

BRAND'S BIG PEONY MANUAL, which we consider the most complete and up-to-date work ever written on the Peony, gives the history of that flower, its culture and varieties. Price 35c, but that amount may be deducted from price of your order.

Growers of Peonies for More than 50 Years

THE BRAND PEONY FARMS
Box 26, Faribault, Minn.

That *Finishing* Touch

Garden Craft Entrance No. 307 (below) for the driveway may be the needed addition to an otherwise perfect garden setting. Gates can be furnished at small extra cost.

Opening 9 ft. wide, 8 ft. high; columns 8 x 8 in. Panels between columns 14 in. unpainted, in sections ready to erect.

Price $125.00

Arbor or Garden Entrance No. 350 (above) will lead you down the path to more happy hours in the great outdoors.

Dimensions 3x4 ft. 7ft. high with posts which have been creosoted extending into the ground 2 ft., unpainted, in sections ready to erect.

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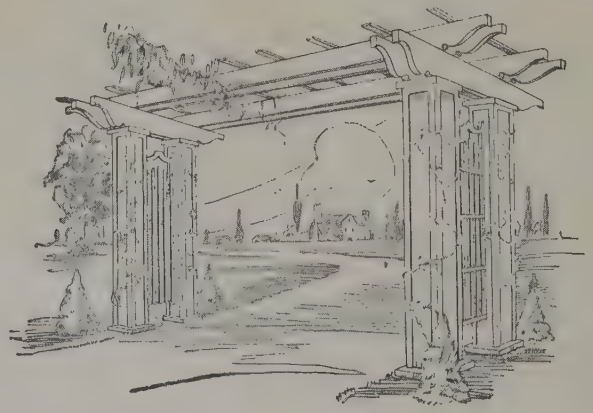

Prices quoted are for cash, delivered f.o.b. your freight office. If your local dealer cannot supply you, you may order direct from this advertisement, or send for our attractive catalog which is filled with suggestions.

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World's largest manufacturers of garden furniture
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New National Forests

Under the provisions of the McNary-Clarke Forestry Act means were established for the transfer to the status of National Forest such lands on military or naval reservations as are growing timber or can be planted to forest growth. Through the cooperation of the War and Navy Departments and the Department of Agriculture, several such transfers have been made and the Forest Service announces the creation of the following National Forests: Meade National Forest, Camp Meade, Maryland, 4,725 acres; Upton National Forest, Camp Upton, New York, 6,200 acres; Eustis National Forest, Fort Eustis, Virginia, 5,000 acres; Humphreys National Forest, Fort Humphreys, Virginia, 3,000 acres; Dix National Forest, Camp Dix, New Jersey, 6,800 acres; Pine Plains National Forest, Jefferson County, New York, 10,000 acres; Tobyhanna National Forest, Monroe and Wayne Counties, Pennsylvania, 21,000 acres; and Lee National Forest, Camp Lee, Virginia, 7,000 acres. Totalling nearly 60,000 acres, these areas will enjoy the advantage of forest supervision, at the same time the military or naval use being preserved.

Another Bird Song

Commenting on the bobolink song in words, printed in the April issue, Genevieve Beardslee, of Cleveland, Ohio, writes us of a similar song of the oriole that has been handed down in her mother's family. It runs: "Oree? Oree? Stranglee? Stranglee? Ex Matoor? Matoor? Chicken bird squat! See-ee-umm?"

Higher License Rates

"The whole work of protecting and conserving fish and game life increases annually because of a greater levy made upon these species hunted for food and sport," says the California Fish and Game Commission, advocating higher hunting and angling licenses. Patrolling, hatchery costs and many other items of carrying forward a conservation program have increased in expense. The commission reports that sportsmen are almost unanimously in favor of higher rates. More credit to them, if so.

SCIENTIFIC WREN HOUSE

It brings the wrens! 4-compartment house for succeeding broods. Beautiful to hang. Green. Oak with cypress shingles. 28" high, 18" dia.
$7.00

SHELTERED FEEDING STATION

Attracts early birds. Operates like a weather vane. Always dry. Green, of pine. With 8-foot pole, shelter 24x22x12 inches.
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FORTY YEARS LOVING STUDY OF THE BIRDS

Dodson Bird Houses

ENJOY THEM, ON A SQUARE FOOT OR ON AN ACRE!

Folks get an idea the song birds must have a park or vast estate . . . Oh, no! There's a little pair of wrens, bluebirds, fly-catchers, just waiting for a home on the eaves of your house. Or on the tree just outside. And they'll WORK merrily all summer to rid you of mosquitoes, gnats, cut worms and insect pests! . . . These scientific houses pay in lastingness. They are the best a famous student of bird life can offer . . . Crated, ready to put up. Order by mail. Or write to Mr. Dodson

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Mr. Dodson is President of the American Audubon Association and Devoted Friend of the Song Birds

QUEEN ANNE MARTIN HOUSE

48 rooms for the beautiful martins who colonize. Scientific porch. White, green trims Of pine, copper roof 22-foot pole, 36x26x37 inches.
$60.00

FREE

Send for Mr. Dodson's fascinating booklet: "Your Bird Friends and How to Win Them." Things you should know about the work of the song birds!

Ask about Dodson's Famous Sparrow Trap, $8.00

REAL DODSON BIRD HOUSES SOLD ONLY FROM KANKAKEE

Give Your Canary A Highball

Prevents Hunger
Gives Exercise
Stimulates Song

15¢

Suspended by a string in the cage, a KAEMPFER CANARY HIGHBALL will give your canary strength-building exercise and prevent hunger. A compound of the most nutritious food and tonic. Stimulates song and health. Send for one today. Enclose 17c in stamps with order (15c for **Highball** and 2c for postage).

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WHY NOT

spend Spring Summer and Fall gathering butterflies, insects? I buy hundreds of kinds for collections. Some worth $1 to $7 each; simple outdoor work with my instructions, pictures, price-list. Send 10c (not stamps) for my Illustrated Prospectus before sending butterflies.

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2 for $1.00

WRENS frequently have three broods a season and are the most delightful of all song birds. Provide more than one nest and attract several of them. Wrens prefer bird houses to any other kind of shelter.

The Wren Wrest is staunchly made of heavy sheet iron, and painted attractively in a bright green. It is weatherproofed and will last a lifetime.

Mail money or postal order to
WREN WREST COMPANY, Coldwater, Mich.

Birds are Nature Lovers

All Prefer RUSTIC Houses

3 for $5.00 and Postage
CRESCENT CO., "Birdville"

Weight of 3, 9 lbs.
TOMS RIVER, N. J.

New Design Colonial Solid Brass Bird Cage

Valued at $12.00. Our special introductory price is $6.00. We pay the postage. Your money back if not satisfactory. Only a limited number will be sold, so send your order at once.

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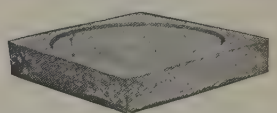

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15 inches square, 3½ inches deep

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Capital $1,000,000 — 6½% UNITED FIRST MORTGAGE BONDS — Resources more than $10,000,000

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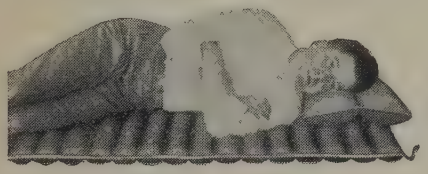

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A Caterpillar Record

It is impossible to estimate how many trees have been saved their summer beauty and, perhaps, their lives by the accomplishment of the 4,067 children in the 147 schools of Westchester County, New York. What they did was to gather 1,827,661 caterpillar egg masses, each mass containing about 400 eggs, which were cremated in bonfires. The county board of supervisors appropriated $5,000 for a bonus of 25 cents for each 100 egg masses gathered. Silver cups were awarded to the pupil in each city or township making the highest gathering, and a county-wide cup was awarded to the Hawthorne Public School, No. 7, Mount Pleasant, where 106 pupils gathered 99,200 masses of potential tree destroyers. The success of the campaign is a tribute to its organizers and to those who took part in it.

Forestry Cooperation

Seven principles upon which state forestry legislation should be based to secure cooperation between the states and Federal Government under the McNary-Clarke Act are outlined in a report made by the subcommittee on state legislation of the National Forestry Program Committee. These principles are: a state-wide policy; consideration only of sustained and official activities as constituting cooperation; adoption of a policy of sustained yield of forests; provision of a system of taxation encouraging forest planting; establishment of town forests where practicable; encouragement of private forestry and creation of a forestry department in every state. The members of the subcommittee were: Philip W. Ayres, Society for the Protection of New Hampshire Forests; Wilson Compton, National Association of Lumber Manufacturers; Shirley Allen, American Forestry Association; and Charles Lathrop Pack, president of the American Tree Association.

A Fitting Memorial

There is no more fitting memorial for one whose life was dedicated to constructive endeavor than a forest. New York has chosen well, therefore, in dedicating a grove in which will stand 10,000 pine trees as a testimonial of what Clara Barton did for mankind. This grove will bear the name of the founder of the American Red Cross for all time.

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Without fly, 3/8 oz. 50c. With fly, 75c. With weighted fly, 3/4 oz. 85c.

A sure-fire fish getter and guaranteed against grouches. You see, Notangle never tangles. Cast it anywhere you like—it brings back nothing but fish. The Bell acting as a weight is set forward and holds the fly straight ahead. The hump holds the bell securely—cannot open accidentally—yet opens easily by thumb pressure allowing for instant changing of hook or fly.

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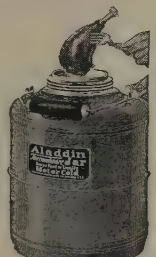

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Decoration Conferred

Charles Lathrop Pack, president of the American Tree Association and of the American Nature Association, has been decorated with the Order of Commendatore of the Crown of Italy in recognition of his activities in behalf of forestry, more particularly in relation to the sending of tree seeds for reforestation in Italy. In acknowledging the honor conferred upon him, Mr. Pack declares that "if these tree seeds develop into living emblems of a better understanding between the two peoples, it will, indeed, be my pleasure to have contributed even in a small way to this great cause."

"Outdoor Good Manners"

This is the slogan and title of a campaign being waged by the General Federation of Women's Clubs through its Forestry and Wild Life Refuges Committee under the leadership of Mrs. Francis E. Whitley, of Webster City, Iowa. The campaign seeks to awaken the American people to exercise care over the property of others and their own property that they own in common with others. Its aim is to educate those who carelessly allow their camp fires to smoulder as they leave them, later to flare up and devastate the park or forest in which they have had the privilege of camping, and in all ways to instill respect for the rights of others in the preservation of Nature's wealth. It is practical conservation and a campaign which deserves national support.

Texas Restocks

The Texas Game, Fish and Oyster Commission, during the past twelve months ending with March, conducted a restocking campaign that resulted in the distribution of about half a million fish, 100 deer, 216 Hungarian partridges, 300 ring-necked pheasants, 550 wild turkeys and about 12,000 quail, most of the bob-white variety. A game preserve campaign put on by *Holland's Magazine* of Dallas resulted in the pledging of 2,800,000 acres of land in Texas as game sanctuaries, ranging from tracts of 10 to 250,000 acres, where proper protection will be given for from five years upward; 7,900 children dedicated their yards to birds, agreeing to feed them in winter and place water for them in the summer; 119,421 individuals pledged themselves under *Holland's* campaign, regardless of hundreds of others who have taken up such work themselves.

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City furniture is as much out-of-place in Nature's settings as a tuxedo worn with hunting boots. In summer camp, cottage or lodge, the natural charm of Rustic Hickory "fits in" with outdoor surroundings.

Master craftsmen have concentrated on this natural wood furniture for over two decades, and have bent their skill toward the now famous Rustic Hickory Furniture combination of beauty, comfort and durability.

Rustic Hickory Furniture is made for both indoor and outdoor use—living-room, dining-room, bed-room, porch or lawn. Everything from smoking stands to dressers for the interior—everything from bird houses to pergolas for the exterior.

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Franconia Notch

Faced by the threat of commercialization of the beautiful Franconia Notch in the White Mountains of New Hampshire, the state has enacted a law providing $200,000 toward the purchase of the Notch for its preservation for posterity. Following the burning of the Profile House and the decision of the owners of the property not to rebuild, sale of the Notch for lumbering was indicated. Conservationists, led by the Society for the Protection of New Hampshire Forests, were aroused by the danger to the beauty of the Notch and to the Old Man of the Mountain and the Flume. The prompt action on the part of the state is expected to be supplemented by the raising of funds by popular subscription for the purchase of the Notch.

Bird Refuge Gift

Twenty-nine acres of land and the income from a trust fund of $15,000 for its upkeep have been bequeathed to the Rhode Island Audubon Society to be used as a bird refuge. The sanctuary is eight miles from Westerly, in the southwestern part of the state, and trees, shrubs and berry bushes will be planted to develop the tract into a refuge.

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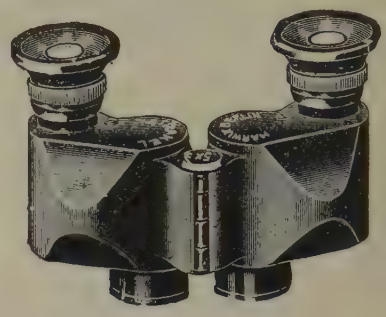

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The Alabama Pecan

Alabama lays claim to the pecan as a native tree as a result of field investigation made by the State Forester, Page S. Bunker, and Dr. Roland M. Harper of the State Geological Survey. Wild pecan trees were recently found near Uniontown measuring some four feet in diameter, and residents of the vicinity told of pecan trees equally large and abundant several decades ago. The pecan, however, had not been listed as an Alabama tree, so after a combined consultation of annual rings and the best recollections of "oldest inhabitants" it has now been placed on the list as a native Alabaman flourishing long before the day when its artificial introduction was probable.

The Fur Supply

The remnants of natural fur stocks in the United States are fast dwindling. The fur supply, once a rich heritage and a prime stimulus for the occupation and settlement of the continent, is seriously threatened by present conditions of lack of uniformity in laws and regulations relating to open seasons, trapping methods, and primeness of pelts. To remedy the unwholesome conditions as far as possible, and before it is too late, the Biological Survey of the United States Department of Agriculture is cooperating with State conservation and game commissions in encouraging the enactment of uniform trapping laws in zones having similar climatic conditions.

Well Stated

Commenting on the change of attitude on the power interests concerned with building the 250-foot dam across the Klamath River, *California Fish and Game*, the publication of the State Fish and Game Commission, urges that none be misled "to support power development as against conservation of natural resources." The commission says: "Let it be made plain that the artificial works of man can be built and torn down at will. We may build a twenty-story building, tear it down and build a new and better one; we can build great dams, tear them out and build better ones; but where is there any human being who can bring back to us any form of life after it has been exterminated? There is a difference between the works of man and the works of God. The one may be readily estimated in dollars and cents but the other has values not possible to estimate."

Regular Boys Like MARBLE'S Tools

These things you need every time you go on a hike, to the woods, lake or river. A dandy axe for making camp, cutting a tree or firewood, a great knife for all uses and a matchbox that will always give you a dry match for the campfire.

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A great knife for every outdoor use. Sharp penetrating point, curved blade of finest steel, back of blade checkered to give firm grip; leather handle, **$2.25**; stag handle, **$3.00**. Including leather sheath.

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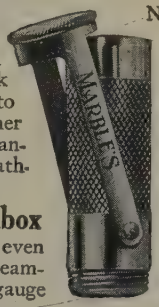
Keeps matches dry, even under water. Made of seamless brass, size of a 10-gauge shell, **60c.**



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Safety Pocket Axe

Guard folds into steel handle, **$3.25**. With 11 in. hickory handle, **$2.00**; 12 in. **$2.25**.

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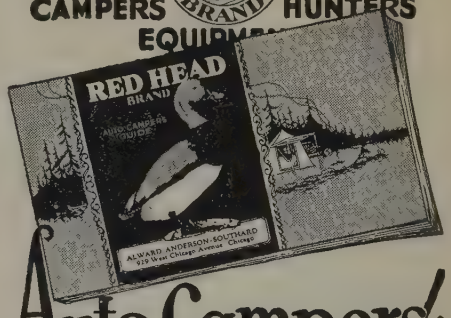

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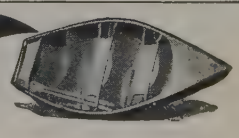

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The Super Bear Cat is a dependable and seaworthy runabout that attains speeds of more than forty miles per hour with the unrivaled 225 horsepower Hall-Scott marine motor. It carries ten passengers safely, swiftly and comfortably. Its luxurious fittings, perfectly appointed leather upholstering, smart Honduras mahogany streamline decks and hull with rakish windshield create a picture of unusual desirability and distinction.

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TREES, BIRDS, WILD FLOWERS
Illustrations by
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GUY C. CALDWELL
(*Of the American Nature Association*)
Official Guide in the Rocky Mt. National Park, Colo.
Imitation bird calls by natural whistling

"The exactness of the imitations was astonishing."—*Pueblo (Colo.) Star-Journal.*

"Your lecture was so charming in its naturalness and real worth that it made one regard the evening as one of the most enjoyable and the lecture one of the best we have had in Buffalo this season."
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Mr. Caldwell's bird slides may now be had from the National Association of Audubon Societies, 1974 Broadway, New York.

Fine Cooperation

Under the terms of an agreement reached between western district officials of the Forest Service and regional Boy Scout executives, the Forest Service will lease available camp sites within the National Forests to the Boy Scouts; cooperate in the teaching of forestry and wood lore; give employment to qualified scouts in reforestation, trail building and forest protection work, where such employment is sanctioned by law and funds are available, and give suitable recognition to all scouts who perform meritorious work or service. In return the Boy Scouts agree to practice and preach care with fire in the woods, to leave camps clean and sign, unmutilated, to distribute literature during forest protection and fire prevention campaigns, and to assist where practicable in national forest improvement work.

Volunteers Needed

In order to make proper regulations for the protection of our migratory birds it is necessary to know where and when they are to be found. The United States Biological Survey has gathered and is still gathering this information, aided by about two hundred observers, some of whom have been sending in their reports regularly for over forty years. There are many localities from which information is still lacking, however, and more observers are needed. The work must be done for love, as the bureau has no funds to pay for it, but instructions and report blanks can be obtained from the Chief, Biological Survey, Washington, D. C.

How to Log

Through an arrangement with operators to whom the Government is disposing of spruce and hardwood in the National Forest in New Hampshire, a series of permanent plots has been laid out by the Forest Service in spruce timber. The trees cut from them will be felled under three distinct sylvicultural methods. Under one plan the spruce and hardwoods will be cut down to trees of small diameter; under a second the larger spruce and fir will be cut out, together with enough hardwoods to give the remaining softwoods the advantage of future growth; and, third, softwoods will be cut clear, leaving the hardwoods intact. The fourth plot in the series will be left uncut for comparison. It is hoped to draw conclusions as to growth in relation to methods of cutting.

Enforcing Fire Laws

Out of 222 cases brought to trial on charges of violating the forest fire laws in 1924 on the National Forests of Washington and Oregon, 197 resulted in convictions, it is announced by the North Pacific District office of the Forest Service. Fines and costs to the amount of $3,096.25 were assessed and 33 civil cases were settled and damages collected covering government timber destroyed in the amount of $17,615. Campers who were careless about fires ranked first among the offenders, people burning brush without permit second, and cigaret smokers third.

New Jersey Bobolink

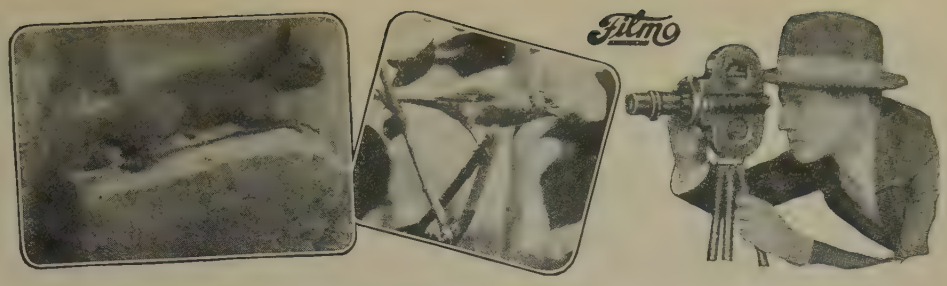
Members of the New Jersey Audubon Society are to be congratulated on the successful campaign waged with the legislature to secure the passage of a bill returning the bobolink to its rightful classification as an insectivorous and song bird in the state. The society swung the legislature to a stand of friendship and obtained a unanimous vote in the Senate and a vote with a single dissent in the Assembly for its bill. A mounted bobolink loaned by the State Museum took part in the debates on the measure, being exhibited by sponsors of the measure in both branches of the legislature.

Herons in the North

Interesting comment on Mr. Brownell's heron article comes from William H. Moore, Scotch Lake, New Brunswick, Canada. He writes that "there was a nesting site of the great blue heron about four miles from my home, covering over an acre of ground until thinned out by lumbermen. Some large poplar trees contained four and five nests each. The most interesting fact, however, was the regularity of the arrival of the birds in spring, coming on April fifth several years in succession. There were fully one hundred nests in this colony."

Expensive Weeds

Weeds are expensive, says the Pennsylvania Department of Agriculture, announcing that an annual loss of $2.64 an acre is caused by them. The State Botanist, Dr. E. M. Gress, is responsible for the estimate that $24,000,000 a year is lost by the farmers who till some twelve million acres in the state. He urges the sowing of clean seed, clean cultivation, crop rotation, vigilance in exterminating weeds and care not to allow them to go to seed. Weed the weed, in other words.



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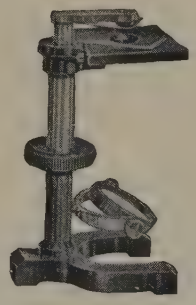

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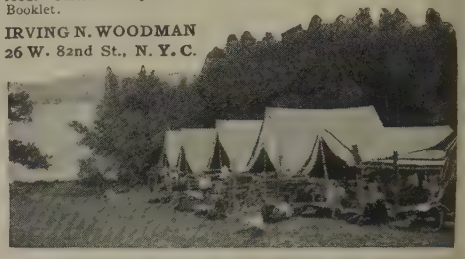

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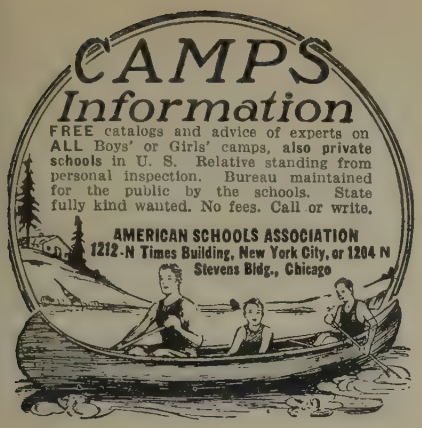
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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *What size doorway should one use in nesting boxes for bluebird, wren, tree sparrow and downy woodpecker?*—J. E. P.

ANSWER: About one and one-half inches in diameter for the bluebird and downy woodpecker. The wren will use a larger hole to allow it to carry in sticks, although an inch hole is usually recommended to keep the English sparrow from competing for a place to nest. The tree sparrow does not nest in boxes, but the tree swallow makes a desirable tenant and will use a box with a hole about one and one-half inches in diameter.

QUESTION: *Can you advise me what power of field glass is best for bird study, star study and general use at ocean or mountain?*—W. F. E.

ANSWER: Selecting the power of field glasses is a personal equation. High magnification means a smaller field, more difficulty in finding the object, and more steadiness of hand required. For all-round work in the woodland we feel the eight-power is the best, better than a higher power, since it is sometimes difficult to find the object among the foliage. For ordinary bird work some prefer even the six-power because of the greater ease of finding the subject.

QUESTION: *Can you identify this bird? It resembles both a blue martin and a blackbird, makes a "chat, chat chat," and a contented kind of cackling sound, its throat vibrating at the time. It also imitates the quail.*—J. G.

ANSWER: This is certainly the European starling (*Sturnus vulgaris*) now common in our northeastern states. It has always been known as a ready mimic in its native countries and, since its Americanization, has learned to ape the notes of many of our species, including the quail.

QUESTION: *Why should one have to have a looking glass or a piece of cedar to induce birds to live in a bird house?*—K. W.

ANSWER: We know of no reason for equipping a bird house with either mirror or piece of cedar. The Biological Survey of the United States Department of Agriculture has available a pamphlet on the building of bird houses.

QUESTION: *Can a snail survive without food and fresh air?*—R. C.

ANSWER: It is not unusual for a snail to remain alive for considerable periods with-

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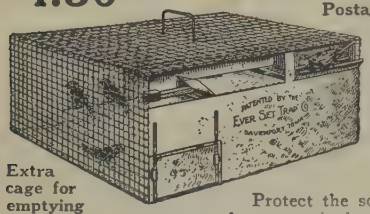

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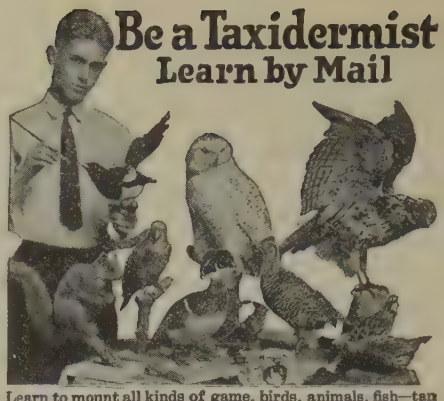

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out food and shut off from fresh air. It is able to close the aperture to the shell by a sort of lid of calcareous matter excreted by the mantle, which is the part of the snail which secretes the material for the shell. The elements are thus excluded and in this condition the snail hibernates.

QUESTION: *I have four coons just a few days old. Can you tell me how to care for them; what, how and how much to feed them?*—C. R. F.

ANSWER: Young raccoons can usually be raised on ordinary milk by the use of a nursing bottle until they have reached the stage when they can take solid food. After they are weaned they eat such a variety of food that their care is comparatively easy.

QUESTION: *Has a mountain lion or lynx ever been known to scream?*—G. S.

ANSWER: Much has been written about the screaming of a mountain lion, but no reliable naturalists appear to have heard it. The lynx has a mewing call but is not known to scream.

QUESTION: *Is the butcher bird or northern shrike of Michigan a predatory bird that should be killed as a pest?*—G. S.

ANSWER: Studies of the food of the northern shrike show that about three-quarters of its food consist of harmful insects. It is, therefore, doing more good than harm.

QUESTION: *Is the pine snake of northern Michigan poisonous?*—G. S.

ANSWER: No, the pine snake is harmless, and we believe that there is no poisonous species in northern Michigan.

QUESTION: *What is the least known—that is, the most outlying town from civilization in the west?*—G.S.

ANSWER: The railroad as representing civilization—a point open to question—the two sections that are to be considered are southeastern Oregon and southern Utah. The "town" nearest the center of the former area is "McDermitt" on the Oregon-Nevada line. Andrews, Oregon, little more than a post office, is nearer the center of the area. As regards southern Utah, where points even farther from the railroad than any in Oregon can be found, there seems to be no settlement that can be called a town. Halls Crossing, evidently a ferry over the river, is near the center of this area.

QUESTION: *Will a timber wolf pup caught wild, and then tamed, remain tame when old if he is treated properly?*—S. G.

ANSWER: This depends largely on the nature of the individual wolf. Some have been known to remain comparatively gentle, others becoming savage.

QUESTION: *Can a good foxhound catch a fox in the open?*—S. G.

ANSWER: Instances are on record of a single foxhound running down and catching a red fox after a long chase. The gray fox is less enduring and, unless it is treed, is frequently caught.

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Volume Five, January-June, 1925

(*Gen.* indicates a general article; *illus.*, a photograph or drawing; *rev.*, a review)

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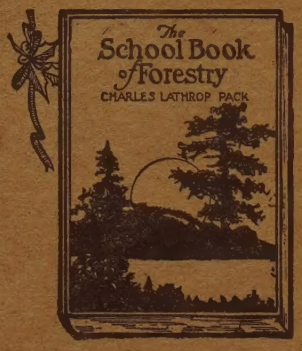

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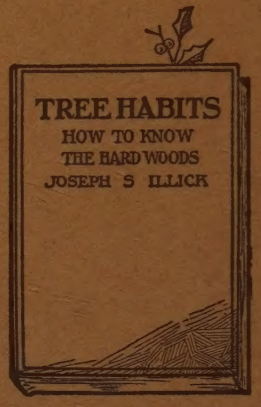

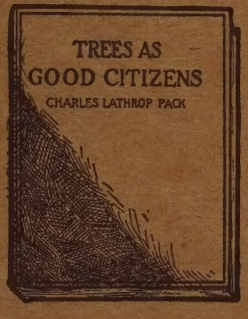

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